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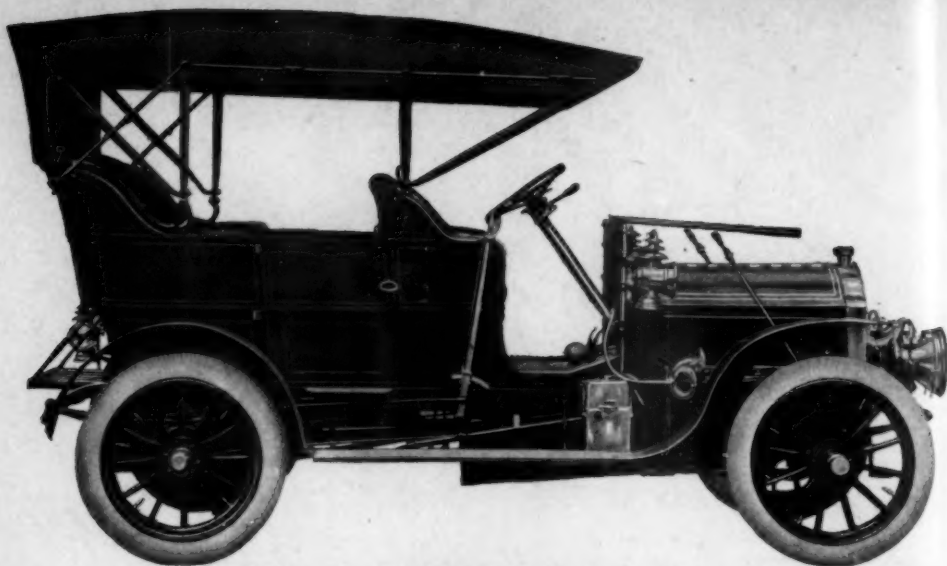
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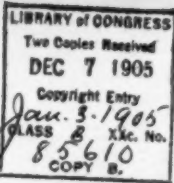
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'MID WINTER'S SNOWS



THE AUTOMOBILE MAGAZINE

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With the Immortal Motorists

By Helena Smith Dayton

WHEN the citizens of Hades flitted down the Rialto one evening and saw a brilliant electric sign announcing that Ananias had gone into the automobile business, they could scarcely believe their eyes. This, however, was the fault of his reputation. Nevertheless, the new garage "caught on" and motorized scorching soon had all other forms of amusement left in the shade. Everyone agreed that Ananias was at his best in praising the car he was selling.

"I was on earth in advance of my vocation," explained the garage keeper to a friend who had dropped in, "but that's neither here nor there. I've got the best and only car in Hades, or on top of Earth, for that matter. It's a flyer, and has the only perfected——"

But at this point a man dashed in with a clatter of sword and a manner that commanded attention.

"My Kingdom for an automobile!" he thundered, imperiously.

"Not to-day, Dick, my boy," said Ananias calmly. "You can't bluff me with that chestnutty quotation of yours. My terms are cash, and you know it. I'm not in the real estate biz, and I've no more use for that kingdom of your's than I'd have for a carload of spotted circus ponies."

"I'll throw in the Flatiron building,"

tempted King Richard; "you couldn't get anything higher."

"You must pardon me if I refuse to dicker," retorted Ananias. "My terms are——"

"I don't care much for your car, anyway," interrupted King Richard stiffly. "And besides, I couldn't wait a thousand years for your prompt delivery!" With this bit of airy sarcasm he was off.

"Nasty temper, that," sighed Ananias. "The very idea! I always deliver my cars the very instant they are promised. I never disappointed a customer in my life. I——"

Again the enthusiastic garage keeper was interrupted. He turned pale as the enraged and portly person came at him.

"Where's that car you promised to deliver six weeks ago?" demanded the newcomer. "A pretty way you've treated me. I've been in here every day for the last six weeks and it's always 'Come in to-morrow, my dear Mr. Jones, and your car will be ready!' The good weather will soon be gone and——"

"We never have any cold weather here," reminded Ananias gently. "But allow me to explain the delay. I am having some special features added to your car and the color of the body changed that will appeal more to a man of your perfect taste. Of course, a piker would have liked the car as she was,

but when I'm dealing with William Henry Jones it's an entirely different matter!"

"When will it be done, Mr. Ananias?" asked William Henry Jones, suddenly meek and affable.

"Next Monday, sure," said Ananias cheerfully. "It's going to be a dandy, Mr. Jones."

"Yes, yes; I'm sure it will be if you look after it," said Mr. Jones. "Good day, sir; good day."

"I'm afraid there'll be a big blizzard and excellent skating in these regions before he gets that car," remarked Ananias, as the pompous party disappeared in a glow of self-satisfaction.

By this time there were many "lookers" walking around the garage and Ananias had a pleasant word for everybody.

"Hello, General Hannibal," he said cordially. "Can I do anything for you?"

"I'm looking for a car especially adapted to hill climbing," replied the general. "I've been challenged to cross the Alps in a motor car, and when I'm in Rome I'm going to do as the Romans do."

"Why—I've got the only hill-climbing car in Hades," declared Ananias effusively. "It's a cinch for you! Excuse me—here's a lady friend with whom I have an appointment to buy a big car."

A resplendent person entered, be-decked and bejeweled. She would have been recognized by any one who ever saw a package of cigarettes as the Egyptian Queen, Cleopatra.

Cleopatra took Ananias by the coat lapels and pulled him to one side.

"I may as well tell you why I want the best car you've got," she said. "Since you sold that one to Helen, of Troy, N. Y., Anthony refuses to go out in my barge on the river Styx, and all he talks is motoring. I see them spinning down the boulevard every afternoon, and the

sight makes me perfectly wild! Now, when can you deliver a car to me?"

"To-morrow," he said promptly.

"All right. And don't forget to have a mirror in it and a place for my powder puff."

A man with long hair—a poet, if one might judge by appearances—entered timidly, leading a blase, world weary old nag.

"What'll you allow for him?" he asked.

Ananias raised his eyebrows and looked sarcastically at his would-be customer.

"My dear man, that object you lead is only valuable as a specimen of a race rapidly becoming extinct. We couldn't allow anything."

"But," cried the poet, shocked and surprised, "this is the great and only Pegasus! Think of it! The mount of genius—the——"

"Cut it out," said Ananias impatiently. "Selling a horse—even if it were the shade of Lou Dillon—is like trying to go up hill with the brake on. Turn old 'Peg' out to pasture and I'll make you a good price on an up-to-date, 4-cylinder, 345 H. P., perfected——" But the gentle poet had fled, with his complaint and his ancient steed.

"Anything doing?" asked a reporter at Ananias' elbow.

"Heard that Tantalus was to be presented with one of our finest cars?" queried Ananias.

"You don't say! Why, he's the guy who never gets anything he wants, and always has it yanked away at the physiological moment, isn't he?" asked the newspaperman incredulously.

"Sure," said Ananias. "But you see they aren't going to let him have any gasoline to run it!"

The reporter turned pale with horror.

"That's rubbing it in," he muttered. "The very acme of cruelty!"

"Another sale I'm expecting to close up is with Phaeton, the god who drives the Sun chariot. Says the horses are apt to shy at the clouds and he gets called good and plenty if he isn't Johnny on the sun spot. I'll put you wise to a good story if you won't use it until I say when."

"Cross my heart," said the reporter eagerly.

"Then I'll show you the touring car the crafty Ulysses has ordered," said Ananias, cautiously. "Follow me."

With great mystery he took him into a display room, the contents of which was one huge car with an immense covered tonneau.

"Sh!" whispered Ananias, "This is on the Q. T."

"What's it for?" asked the reporter unimpressed. "It looks like a Harlem flat on wheels to me."

"If you'll go home and dust off your copy of 'Eastern Nations and Greece,' said Ananias, in a superior manner, "you'll find that once upon a time Ulysses filled a wooden horse with soldiers and put it outside the Trojan gates. Curiosity made the Trojans take

it in, and during the night the soldiers in the horse got busy. Well! The wooden horse dodge is played out. No up-to-date Trojan would get taken in by a wooden horse even if it was as big as a church. But"—the speaker's voice dropped to a whisper—"fill the tonneau of a swell new automobile with soldiers, and it's a case of where history repeats itself!"

"Oh!" said the reporter, in respectful admiration.

"I gave him the idea," said Ananias proudly. "But have you noticed that this car has the only——"

"Sorry, but this is my busy day," the reporter remarked hurriedly. "See you later."

"Ananias," said a Smart Alec, who overheard the garage keeper start on his monologue of what his car possessed and all other cars lacked, "I've often heard you start that song of praise, but you never get a chance to finish it. I'm like the small boy who wanted to hear what happened next."

"The horse died," snapped Ananias, as he went forward to welcome another customer.

A Valuable Experience

By G. E. M.

THE Japanese who had graduated from Columbia had been arrested in Vladivostok as a spy, and had been condemned to be shot. At the hour fixed for the execution he was taken to the Whiskeriski Prospect and nine soldiers leveled their muskets at him. He refused the offer of a handkerchief with which to cover his eyes, and glanced calmly, even smilingly, at the glittering, death-dealing weapons.

"Fire!" shouted the Cossack sergeant. The nine explosions were as one, and as the smoke cleared away the sergeant

stepped forward, expecting to see the prisoner riddled with bullets. But the Japanese still stood there, calm and smiling, and apparently unharmed.

"Your muskets were not loaded!" cried the sergeant with a great oath, turning to his men. "I will have every one of you shot as traitors at sunrise to-morrow. I will!"

"No, no; don't blame those fellows," interrupted the Japanese. "They did their duty all right. Nine bullets came out of those guns. I simply dodged them."

"Dodged them!" shouted the sergeant, angrily. "Do you dare to play with me?"

"No," answered the Japanese, coolly, "I am telling you the fact. Dodging those bullets was dead easy. Why, man, I lived in Long Island for a couple of months before coming here, and twice a day I dodged the motor cars on the Merrick Road. Your bullets aren't in it with the Death Loop fliers that used to skiddoo down Long Island."

Long or Short Chassis?

The long chassis, undoubtedly, is the acme of comfort in a motor car, if for no other reason that with it the passengers in the car are not cramped. There is also far less vibration from the engine, and hardly any at all from the roads. This same difference is also noticeable between a long and a short ship in a seaway. It is not an uncommon thing to see cars going along with the back part, as it were, dragging in the dirt, because the body is overhung in an attempt on the part of the maker to gain space for the occupants. Nothing looks worse. When the excessive overhang in the short wheel based car is not attempted, the chauffeur has no room to manipulate his pedals, or to put a rug over his knees or even to get into his seat. In some makes the wheel base of a car has little or nothing to do with its seating comfort, which depends on the rake and height of the steering-pillar, the height of the body, the situation of the

engine and the length of space between the dashboard and the center of the rear axles. The "mixed" type is now, generally speaking, in favor; this usually means it is neither one thing nor the other, or a little of each, hence it is called "mixed." The very natural inquiry then is, "Why not get a 'long' base in preference to a 'short' or 'mixed'?" The reason for not doing so is this: As a rule the long chassis costs considerably more; the weight of the chassis is increased, and in consequence it requires more gasoline to drive it; it is slower on the hills; the life of the tires is not so long, because they have the extra weight to carry. The vibration is less, without doubt; there is more room, and the car looks nicer; but at the same time, with the long base, the car requires to be driven slower round corners, and is more difficult to turn. To overcome this, the makers narrow the frame to enable it to be more easily turned. As long as the public will have the side entrance, so long will makers continue to build the long chassis so as to accommodate them.

Reducing Partly Slaked Carbide

Where a quantity of carbide has been exposed to the air by accident, and has become partly slaked, it is sometimes possible to redeem it by shaking it violently in a coarse sieve, thus removing from the outer surface of the lumps the slaked portion, and leaving that which is uninjured exposed to the air.



Practical Information for the Winter Motorist

A Careful Digest of What Experience Has Taught the All-Year Devotees of Automobiling

By "The Tourmaster"

OF course, the care of a motor car in winter is a very different thing from what it is in summer, and every owner who is interested either in economical all-year operation, or in the appearance and action of his machine, must give this matter more or less attention. In fact, it is almost a plain case of getting and keeping the machine in proper trim for winter running, or of putting it into storage throughout the cold weather. There are absolutely no half-way measures here.

Precautions against freezing must first of all be taken by operators of water-cooled gasoline automobiles. The best formula for an anti-freezing solution is generally considered to be water and calcium chloride, in the proportion of a gallon of the former to from three to five pounds of the latter, depending upon the point to which the temperature is likely to drop. A mixture of 3 pounds of the chloride to one gallon of water will freeze at about zero Fahrenheit, and a mixture of four pounds to the gallon at about 20 degrees below zero. In very few cases is it necessary to provide for anything colder than this in most parts of the United States.

In buying, be careful to get a good and commercially pure grade, as impurities are likely to have an injurious effect on the valves and other metal work. Do not get chloride of lime by mistake; this material is very corrosive to iron and steel, and is undoubtedly the cause of injuries often laid, incorrectly, to calcium chloride. Losses from the chloride solution, due to evaporation, should be made up by adding pure water, while losses by leakage should be made up by adding fresh solution. It is well to draw off the solution once in a month or so, washing

out the pipes, and the like, before replenishing with fresh solution.

Dissolve the calcium chloride completely before putting the solution into the tank; and it is advisable to strain it also. However, as this mixture has a tendency to corrode some radiators, it is usually advantageous to add a handful of unslaked lime to neutralize any free acid that may be present. A combination of glycerine and calcium chloride may be also used in the proportion of 10 to 15 per cent. of glycerine and three-quarters of a pound of calcium chloride. With this mixture it is not necessary to add the lime.

Next to calcium chloride, a 20 to 25 per cent. solution of glycerine is most commonly used for the prevention of freezing of water in a gasoline motor. However, it should be remembered that this fluid will attack the inner walls of the rubber tubing commonly used for connections, although it appears to have no deleterious effect on metal tubing. For this reason carbonate of soda should be added to neutralize the acids which may be present in the glycerine, the soda being first dissolved in water. A suitable proportion is 12 gallons of water to 3 gallons of glycerine and one pound of carbonate of soda. This mixture congeals at minus 9 degrees centigrade, but never solidifies enough to cause injury, and readily dissolves at the first strokes of the motor.

Of course, there is more or less bother connected with the use of these solutions, which has been one reason for the gradual progress of air-cooled cars in popular favor. Various expedients have been tried with more or less success. A practicing physician in Detroit, Mich., employing a runabout in his professional

work, uses no glycerine or other mixture in the water. Here is his method, as communicated recently to one of the weekly automobile journals:

"Take a wide piece of common oilcloth and attach beneath the cylinder; bring it up around and over the mixer and water tank, then lightly stuff a piece of waste felt in between the mixer and oilcloth. This keeps everything warm, so that one turn of the crank is sufficient to start the engine. Then the coils under the dashboard are protected with oilcloth tacked on and brought under the coils and secured." This may be an interesting suggestion to others, though it is probably more applicable to a runabout in local service only than to a touring car making long and hard trips.

To prevent the water in the generator reservoirs of acetylene lamps from freezing, a solution of chemically pure salt—sodium chloride—may be used. Common salt contains magnesium chloride, which acts upon metals, and hence it should not be used for this purpose. As an alternative add a small quantity of alcohol.

Frost forming on the carbureter is sometimes a source of trouble in cold weather, and it has been known to form in the passages when traveling in a cold rain. Either of these troubles interferes with or prevents the proper action of the apparatus. If one of the air passages is provided with a tube opening near the muffler or a warm part of the mechanism there should be no difficulty from this cause. Failing this provision it is not a difficult matter to attach a piece of rubber tubing or hose leading to a source of warm air, as a temporary expedient, until a metal tube can be fitted permanently. Some operators wrap the carbureter with asbestos rope during cold weather, in addition to fitting a warm air tube, in order to retain as much heat as possible in the apparatus.

It is surprising how the water in the machine will freeze when the temperature hardly seems low enough to congeal anything. Should only a small quantity of water be left in the system its freezing will not burst anything, it is true, but it may still cause the pump to stick tight enough to break something when the unsuspecting owner puts too much strain on the starting crank in the endeavor to get the motor under way. The difficulty of cranking the motor that has been standing all night in the cold is considerable, as the lubricating oil is much thickened by the cold, causing every bearing and frictional point to resist stoutly the first pull on the crank, so that the driver would not notice the slight additional resistance due to the sticking of the pump. Note the reference to lubrication in a subsequent paragraph.

Although everybody knows that heat is required to generate steam from water, it is not so evidently apparent that heat is required to vaporize gasoline, although such is the case, the process taking heat from the walls of the carbureter and tube by absorption. As vaporization continues, the metallic parts may become chilled to a degree sufficient to turn the surrounding moisture-laden air into frost, which collects on the carbureter and other parts.

When the carbureter is chilled, vaporization is seriously interfered with, because there is no source of heat to aid the process, and the gas mixture will soon fail to explode regularly, if at all. Especially if the car has been standing for some length of time with the motor idle, and it refuses to start, get a pail of boiling water and pour it slowly over the carbureter and induction pipe, taking care, however, to prevent any water from entering the carbureter.

On a cold or foggy day, if the motor will not start up readily, there may possibly be nothing wrong except the fact

that the chauffeur does not turn the starting crank fast enough to cause the gasoline to properly vaporize. Remember, that a few quick, energetic turns will start up the motor better and quicker than fifteen minutes of slow cranking. Always remember to retard or set back the ignition timing mechanism before starting the motor with the crank. If this is not done, back-firing or premature ignition may occur, with the result that the operator may get a broken arm, or at the least a sprained wrist.

A small squirt oil-can filled with kerosene is useful to remove gummy deposits from the valves and to free the piston and rings from carbon liable to accumulate on them. If the car you contemplate purchasing is not equipped with a mechanically-operated lubricating device, insist on having the gravity feed oil tank so connected with the battery controlling switch that when the electricity is cut off the oil supply is stopped also. It will save lots of time and trouble.

There are six things to notice if the motor does not start after turning the crank, any one of which may be the cause of the trouble. These are: battery switch not turned on; carbureter flooded, giving too rich a mixture; gasoline supply shut off; the cold weather causing poor or imperfect vaporization of the gasoline; stale gasoline; stuck valves, causing loss of compression.

More flushing of the carbureter is apt to be required in starting in cold than in warm weather, but this should not be carried to excess. If the mixture is over-rich, it will be necessary to work off the surplus by turning over the motor until the mixture is reduced to an explosive quality. Another cold weather hint is to drain the gasoline from the carbureter if it has been standing for some time, as it is apt to become "stale," and make starting difficult. Of course, gasoline in the tank becomes stale in time, but

that in the carbureter does so more rapidly owing to the small quantity contained in the float chamber.

Another matter to be given careful attention is lubrication. Oils thicken greatly in cold weather, and they will not flow readily, if at all, through the feeds; therefore, a thinner oil should be used in winter than in summer. All dealers in automobile supplies keep winter oil regularly in stock, so no difficulty will



ordinarily be experienced in obtaining it. However, in emergency, if the lubricating oil gets too thick, mix ten per cent. of kerosene with it and pour it back in the cups. When making this change in oils it is an excellent time to give the motor a thorough flushing out with kerosene. Do not use gasoline for this purpose, and take particular care that oil feeds are well cleared, so that there will be no obstruction to the flow of the thin

oil by the residue of the same lubricant. The use of a poor quality of lubricating oil leads to a diversity of evils, apart from inferior lubrication.

When it rains those who use a vertical glass on the front of their automobiles as a windshield often find it very annoying when the glass clouds over with the rain-water and becomes quite opaque. The driver probably finds it difficult to distinguish the road, gets fatigued and nervous and fears that an accident may happen at any moment. A simple remedy is to wipe the glass with a rag saturated with glycerine. It dims the glass slightly—much less than oil—but the glass remains transparent so that the road and all surroundings can be distinguished with comparative ease. For glass-front electric broughams, as well as for the windows of other closed carriages, the same remedy is, of course, available, though it is not so much of a necessity as where the driver is behind the glass.

Those who have driven much in the winter know the difficulty of keeping warm while driving a car. It is not so much the body which feels the nip in the air; a fur coat and leather waistcoat or chamois underclothing will effectually keep away King Frost from the body. In default of a fur coat, an excellent protection against cold is to don a thick overcoat and to put over this a good mackintosh.

Warm wool or fur-lined gloves will protect the hands, and a wool-lined cap with ear-flaps will keep one's head warm. One of the chief difficulties is to keep the feet warm and to avoid footwear that is thick and clumsy. This caution will be especially appreciated by those who are obliged, in case of accident, to get out and walk 'steen miles for a team. Winter styles of automobile clothing are now offered in so great variety that detailed information in that point is un-

necessary, while devices for heating the car have been brought out and are used with considerable satisfaction and success.

Within the next few years at least the development of thoroughly satisfactory winter motor cars is sure to become a more careful study of our most progressive American makers. Without doubt the demand for them is already being felt, while the inquiry for such cars has grown to be considerable. Of this new interest both the manufacturers and the public may profitably take notice, as this development is certain to materialize in the very near future. Certainly nothing in this connection can be called in the nature of a "fad," but rather something which the industry is bound to press to the most satisfactory conclusions. People who become so thoroughly accustomed to their machines as to use them daily for three seasons in the year must surely miss them when they put them aside at the command of severer weather.

That distinctively winter automobiles will be welcomed by business and professional men more than by "butterfly" tourists and pleasure seekers solely, goes without saying. They will be appreciated by the physician whose horse, fagged after morning calls (perhaps dragging a heavy vehicle through deep snow), is not in condition for a last urgent trip. Then there is the business man with numerous appointments in different parts of the city not entirely reached by street car or other public service, and for whom the public cab is much too slow. So to the woman of society, who must take note of a hundred social obligations and whose time must also allow for the usual amount of shopping. Public officials, such as inspectors, fire chiefs, etc., will find in the all-year vehicle the means of accomplishing much more within a limited time than they otherwise could.

Importance of Compression

By William G. Carrington



NOT many men who talk so glibly about the cars they own, the construction and the equipment thereof, really understand why the gas in the cylinder of an explosive motor should be compressed before it is fired. The first impression a car owner has is that the work compression demands is not likely to be compensated for by the advantages obtained. However, this prior compression is of the greatest importance—in fact, were it not for compression, the gasoline car would not be in existence, and gas engines would be buried away with many so-called freaks or retained only for exhibition purposes in the laboratories of the students.

The earliest forms of gas engines, of the non-compression type, used to draw in a charge during the first half of a down stroke. The inlet valve was then shut and the gas fired, doing work on the piston for the remaining part of the stroke. On the up stroke the exhaust took place.

Subsequently it was suggested that the charge should be taken in during the whole stroke, the piston caused to return and compress the charge ready for firing and expanding throughout the whole stroke. In an engine of the same dimensions then, a whole stroke was given for filling the cylinder and for getting the work out of it again on the next stroke.

To get the maximum amount of work out of a given quantity of fired gas, a maximum amount of heat must be con-

verted into work, and as little heat as possible allowed to pass to the cylinder walls, jacket, piston, and exhaust. It follows, therefore, that the surface of the cylinder wall and piston face, with which the hot gas is in contact, should be reduced to a minimum. In the non-compression engine the surface was large, compared with that in the gasoline engine as we know it now. In the old type of engine, a great deal of heat was lost in this way, which is nowadays converted into useful work. Another cause of high efficiency in the modern engine is that when the charge is fired under compression, the initial temperature is high, but falls rapidly for a small movement of the piston, thus still less heat is lost to the jacket. The more closely packed the charge is, the more rapid and complete is the combustion, and consequently less heat is lost in the exhaust.

With the old engine the best firing mixture was composed of about seventeen parts of gas to 100 of air, while at present the proportion is eight to 100, that is to say, the fuel consumption is halved. In theory it would seem that there was no limit to the compression pressure, but it must be noted that increasing the compression increases

1. The liability of self-ignition.
2. The liability of leakage.
3. The stresses on the parts.
4. Difficulty in ignition.
5. Difficulty in lubrication.
6. Difficulty of starting.
7. Difficulty in running the engine slowly.
8. Size of flywheel.

Most of these increase with the size of the engine.

Some time ago a number of very interesting tests were made of an engine

with different compression pressures. In the first test, with a compression of 60 pounds to the square inch, 20.8 B. H. P. was developed, the consumption being 22 cubic feet of gas per brake horse power. The compression was then raised to 90 pounds to the square inch, and 24 B. H. P. was obtained, the consumption being only 20.75 cubic feet per B. H. P. The engine speed in both cases was the same.

High compression is by no means, however, synonymous with good compression. A leak, resulting in faulty compression, means that on the suction stroke, inert gas is drawn in through the leak, on the compression stroke some of the charge is lost, and on the firing stroke useful gas is wasted. Defective compression is thus the chief cause for an engine failing to maintain its power, hence to keep an engine in good trim the compression should always be maintained at its maximum.

The compression is dependent on the atmospheric pressure, which, of course, varies with the altitude. This means that there is a slight falling off in compression, and consequently in power, as the car climbs. This is practically negligible in the case of a car in ordinary use.

This brings me to place where I may fitly make a plea for a consideration of the much despised alcohol as a possible successor to the now all-mighty King Gasolene. It is generally stated in text books—and, of course, what you read in a text book must be right—that gasolene cannot be used in an engine which has a compression of more than about five atmospheres. That is 75 pounds to the square inch. Ignoring the fact that I already have a gasolene engine running at ten atmospheres without pre-ignition, taking the text book statement as being correct, it means that gasolene cannot possibly give anything like an

ideal efficiency. The higher the compression the greater the efficiency which results.

Now, you cannot run an alcohol engine efficiently unless you give it ten atmospheres compression, and it will run better if you give it fifteen. In so far, therefore, that an engine running at a high compression gives you the most nearly theoretical results, the alcohol engine is much more suitable than the gasolene engine. When I said that I know of a gasolene engine running at this high compression, I must say that it was built in a special way. The workmanship was carried out in a way which would be impossible in engines built in quantity for commercial work, and even in this case it is questionable if the engine would run for any length of time without pre-ignition.

Using gasolene or benzol, or any of these fuels which split up into lower hydro-carbons, you are bound to get soot deposited under some conditions. Momentarily you are cut short of air; momentarily you have a small globule of gasolene sent up by your carbureter which has not got thoroughly vaporized; the outside of that globule gets burned, and you will get some hydro-carbons deposited on your cylinder. It is this carbonaceous matter which stops red hot after one explosion, and is possibly glowing when you get your next suction stroke, and you get what is called pre-ignition. You will not get pre-ignition with gasolene with ten or even fifteen atmospheres if your cylinder is a polished one. You have no carbon deposited and no sharp points sticking out which can get red hot and remain so from one explosion to another.

I may say that for practical purposes a gasolene engine won't work above five atmospheres compression, but with alcohol an engine will work at a very high

grade of economy at ten and fifteen atmospheres. I can imagine those of you who are connected with the manufacture of automobiles saying, "Yes, but what about starting a five by five cylinder on fifteen atmospheres compression?" But mechanically the thing is quite easy, and must not be looked upon as a difficulty.

Just as it is possible and advisable to make use of a half compression cam for starting and other purposes, so in the alcohol engine you could have a one-half or one-third compression cam fixed, but that is another story, and so I will have to reserve it for a subsequent telling.

Wood Block Pavements

By Albert E. Rothermel

THE subject of wooden block paving for city streets is one in which much interest is being manifested by automobilists and other advocates of modern street surfacing in many of the large cities of this country, now that European cities have demonstrated the durability and comfort of such paving.

In Boston wooden streets have been tested and found entirely satisfactory. They have been tried with similar success in southern and western cities. These wooden blocks have been found noiseless, sanitary and of longer life than asphalt, and far cheaper in the matter of repair. London and Paris well understand the advantages they offer. The "roar" of London comes from her wooden highways; New York's "roar" is an ear-splitting, rattling clatter. Woods of moderately good quality wear ten or twelve years under the great traffic abroad, while it is argued by engineers that with harder, better, more durable, and more effectually treated woods, block pavements in the cities of this country would have much longer life.

Foreign statistics regarding wooden pavements show that they have a longer life than asphalt pavements; in some cases they have equaled granite paving in point of existence. Wooden pavements are completely noiseless, a

matter of prime consideration in cities; they have remarkable sanitary properties; they are not slippery, are easily cleaned, and are at once tough and elastic.

In the matter of noiselessness, not only is comfort promoted, but those who are familiar with wooden roadways say that this characteristic has a direct money value on business thoroughfares, especially in the summer season. It is then, when windows and doors must be kept open, that the noise in an asphalted or granite-block-paved street becomes almost unendurable, and merchants and other business men would be glad of the relief the noiseless wooden block affords. Also, it is urged that the streets around hospitals, churches, libraries and public buildings generally would enjoy a measure of comfort with wood paving not to be obtained otherwise.

There have been several phases of wood paving in this country. First came the corduroy road; then round or hexagonal blocks were used, but, as they were not treated by special process, they rotted away. Being about one-third sap wood, they rounded at the edges, softened, sank into ruts, lacking proper foundation, and became saturated with the filth of the streets. What alone recommended them was their cheapness.

Next came the process of squaring the blocks and dipping them in tar. Little care was exercised in selecting the wood. It might be hard or soft; heart-wood or sap, seasoned or unseasoned—the dipping in hot tar covered the multitude of sins and made all blocks look alike. Laths were laid between the blocks, and the large seams thereby made allowed water to run in under the paving. It did not require much time under these conditions to demonstrate that such paving was a poor investment.

The last phase is the creosoted block of selected heart-pine, Georgia pine, preferably, creosoted with at least ten pounds of dead oil to the cubic foot, laid on a thin sand cushion spread upon a concrete bed. This kind of pavement has been laid extensively in the West and South, in Terre Haute, Galveston, New Orleans and Indianapolis. In the last-named city more than 50,000 square yards of it were contracted for last year, after the city had seven years' experience with wood pavements.

For more than thirty years London has used wooden paving. It is laid in the finest roadways as well as in those where the traffic is heaviest. There are in London about 4,000,000 square yards of wood pavement. From 1874 to 1884 1,000,000 square yards were laid. Ten years ago karri and jarrah, the Australian woods, came into use, but now they are not looked upon with great favor, having been supplanted by creosoted Swedish deal. The majority of London pavements now being laid are of this wood. The first London wood pavements were put down in 1839, but the practice of laying wood on concrete was not begun until twenty-seven years ago.

As to the life of wood pavement, Mr. Weaver, surveyor, Kensington

district, has reported that "creosoted five-inch blocks in High street, Notting Hill, and Fulham Road, lasted twelve years."

In Paris the extent of wood paving is four times that of asphalt. In 1891 484,000 square meters had been laid, and four years later, 1,165,000 square meters. The amount of asphalt down at that time was 382,600 square meters, and of macadam 1,348,000 square meters. The city authorities manufacture and lay all the wooden pavements in Paris, the capacity of the several municipal factories being about 47,000 blocks, or 1,000 square yards, per day. The woods used are teak, karri, pitchpine and native pine, which are named in the order of their wearing qualities.

In the principal thoroughfares of the French capital the traffic is enormous. In the Rue de Rivoli it amounts to 65,000 teams per day, and in the Avenue de l'Opéra it is more than 66,000. Fifth avenue and Madison avenue have a traffic which is about one-eighth of that in the two named Paris streets. Investigation shows that under Paris traffic the native woods wear on an average about one centimeter, or a third of an inch, a year. The blocks are permitted to remain until ten centimeters of the total depth of fifteen centimeters have worn away, and they are removed. Thus, the Paris pavements, with enormous traffic upon them, have, with inferior wood, a life of about ten years.

Owing to the fact that in Paris horses are not permitted to have calks upon their shoes, the wear is probably not so great as upon wood pavements in this country, but the greater volume of traffic probably counterbalances this. The absence of calks indicates that wood pavements are not slippery. As soft wood is presumably

used in Paris, a thin layer of sand and fine gravel is placed upon the blocks, the gravel being crushed and ground into the fiber of the wood. This is not so frequently done in London, but here are figures in regard to the slipperiness of London pavements compiled by Col. Haywood, C.E., in charge of the pavements and sewers of that city, during a 32-days' observation: The total number of horses which fell or partly fell were: On asphalt streets, 437; on wood, 326; on granite, 134. The number of complete falls: Asphalt, 190; granite, 130; wood, 39. Slipping to one knee only: Asphalt, 107; wood, 10.

Wooden pavements are peculiarly adaptable for use as roadway for bridges. Being light and smooth and durable, they possess many advantages over the pine planking which is generally used. Bridges so floored are constantly under repair, but wood paving has been found to stand the wear and tear of years.

The modern method of laying wooden pavements is to set the blocks on a carefully built foundation of concrete from four to six inches deep, the depth depending upon the sub-grade and the traffic. The wearing surface thus given is from two to three times as deep as that of ordinary asphalt roadways. The blocks may be laid either on a thin sand cushion spread on the foundation or on the concrete itself, according to the traffic and other conditions they are called upon to resist. To the automobilist all matters appertaining to improved street surfaces are important and the coming of the wooden block pavement will therefore be watched with considerable interest. Abroad, as a rule, the wooden pavements, particularly in bad weather, are regarded as safer and in every way better for motor car use

than even the best of asphalt, and there is no reason why the same verdict should not be given in their favor when American automobilists are called upon to pass upon them.

Letting Tires Take a Rest

Where a car is not to be used for a considerable period of time, the tires should be removed from the wheels and the air tubes carefully examined and tested. If found to be in good condition the tubes should be treated to a liberal dose of French chalk, put into a bag or box, and stowed away, preferably in a dark room where an even medium temperature can be assured. The covers should be very carefully gone over, and all cuts, whether large or small, should be treated in the manner each requires. If this is not to the liking or beyond the capabilities of the owner, the tires might be sent to the manufacturers for general overhauling and repairs. This would really be the most satisfactory procedure. For the storage of the outer covers of the tires, the same conditions apply as to the inner tubes. Since, however, their bulk is very much greater than that of the inner tubes, the most handy method of protecting the shoes for storage is to bandage them round with strips of canvas. The writer once had occasion to lay aside a set of tires, and instead of using French chalk for the outer covers, he used flowers of sulphur in a very liberal manner. After the tires had lain by for some months, they were brought out, and looked as fresh and as good as ever. Not only so, but they showed no signs whatever of hardening or cracking, and retained their elasticity to the fullest degree. This was probably due to the fact that sulphur is the principal component used in the vulcanization of india rubber. It is noticeable, as a general rule, that in course of time the sulphur exudes from the rubber, leaving it in a very

spongy form, thus allowing air to enter. This hardens the material, so that it eventually breaks up into small patches. I tried the sulphur, therefore, as a matter of experiment, on the theory that sulphur thus applied to the outside of the covers would prevent that which was contained in the substance of the rubber itself from working out. I was pleased to find that my theory was borne out in practice. If it is not convenient to remove the tires from the wheels, the car should at least be jacked up and packing put underneath the axles, so that the wheels may be kept well off the ground.

Winter Care of Tires

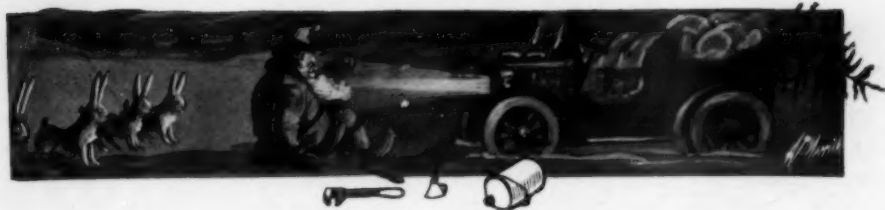
As a rule, toward the end of the season owners are less particular about the condition of the tires on their cars and less prompt in sending them to be repaired directly they show any signs of wear. In fact, many delay sending the tires to the manufacturers until they absolutely cannot be used any longer. Others take off the tires, wrap them up carefully and put them away according to all the rules for good preservation laid down by makers. And when the fine weather returns and they wish to take to the road again, they are surprised to find that the tires cannot be used until they have undergone some repairs; and so they have either to wait until these repairs are executed or buy new tires. It is much

more simple, in order to prevent this contingency, to send all faulty tires to the repairers now. The repairs will be done much quicker at this season of the year than in the spring, when everybody in the trade will be overwhelmed with orders, and besides, the tires will be preserved just as well during their unused period after they have been repaired.

What Care and Carelessness Do

The life of a motor depends to a surprising extent upon the treatment it receives. Its failure, except as regards worn bearings, almost invariably is due to careless or rough handling in some way rather than to legitimate use. There is little or no choice between the two evils of racing and laboring, both bringing about a great deal of wear and tear, and endangering the working parts while it is going on. Another evil to be studiously avoided at all times is that of running with too early ignition, as that racks the parts frightfully, and at the same time detracts from the power to a surprising degree. It is really nothing more nor less than a matter of sympathy between man and motor, the perfect handling of the machine, and it is possible in the highest degree only with one who so loves the inanimate mechanism that it really pains him, "goes against his grain," is a more conventional way of putting it, to see the thing abused.





New Models Again at Hand

Foreword to Our January and February Pictorial Reviews

NINETEEN HUNDRED AND SIX automobiles are making their appearance from a month to six weeks earlier than did their predecessors of any previous year. In fact, many of them are out at this writing, and not a few have already passed into the hands of the prompter buyers. Photographs and descriptions of the new models are going out to inquirers by hundreds, and a high tide of interest in them has been secured well before the close of 1905.

This special forward movement has been largely, of course, in the way of preparation for the mid-winter shows. But the swift progress which the American manufacturers have been making for the past three or four years puts them now in a position to move their products somewhat forward in point of time. This not only gives them a longer selling season than would otherwise be possible, but they are able to do a lot of good business in advance of the bulk of the importations.

A comprehensive pictorial review of the new models is planned for the January and February numbers of THE AUTOMOBILE MAGAZINE. This will give what most readers most desire, and can best understand; namely, a general view of the prominent and successful cars offered by the home industry and the leading importers. It is expected that this display of types and models will be found of use and value to very many people who are interested in automobiling only

in a general way, without much technical knowledge of the subject. It is safe to say, however, that a lot of these will become owners before the 1906 season opens; it is from this great class of interested people that the ranks of motoring are being constantly enlarged.

Unpracticed eyes will not always notice a great deal of difference between the 1905 and 1906 corresponding models of the same factory, but to the close student of automobile engineering the new products will be of absorbing interest. They will show refinements of design and construction which prove that a close equality has been attained with the best outputs of the European workshops. In the young but tremendously vigorous industry of motor-car building, a single year naturally means a great deal more than it does in any long-established manufacture, and much more is now made of annual changes in design and construction than is likely to be the case in future years.

There is a natural progress of the industry like the natural progress of mankind from one generation to another. The writer of these lines heard a gentleman a while ago make the remark, in a self-satisfied way, that he expected his children to be smarter than himself. The one addressed, a person renowned both for his bluntness of speech and his accurate interpretations, answered that a parent whose children were not smarter than himself ought to be ashamed of

himself. So it is, in a way, with any progressive industry; advancement from one year to another is to be expected, and one who cannot successfully follow out this law is not long successfully identified with it.

One prominent American manufacturer has boldly announced his 1906 product as an exact duplicate, in all essential particulars, of its 1905 predecessor, but this is a striking exception to the general rule. Most of the manufacturers or importers, or their agents, will talk loud and long of the particular "new" things in their line, possibly intimating the while that no competitor whatsoever has been able to make equally great strides. Others will show a list of "specifications" no less impressive than bewildering to the great majority of readers. And a table of specifications dealing with a big modern automobile is nothing small, either in size or meaning.

But it is to be seriously doubted if very many people buy cars from such tables. In most cases we think that if one will find a model that suits him in respect to power and price, making his selection from the output of thoroughly responsible manufacturers, he cannot make much of a mistake nowadays. If, after the purchase, the novice owner will serve a thorough apprenticeship to the one car of his choice, we think he will become far more proficient than he could be after trying to master the science of mechanical propulsion entire. A lot of people who have been absorbed in the subject for ten years, more or less, admit there is much yet to learn.

A longer "wheel base" is the mechanical foundation upon which the luxurious machines of to-day are built. Up to a year ago wheel bases of 100 inches were seldom seen in this country, though they have been common abroad for a much longer time. To-day a considerable number of the new cars exceed this

length between axles, while very few, except of the smaller models, fall more than a very few inches short of this figure. As a matter of fact, the medium base has followed the short one of a few years ago and almost passed away, so far as concerns the large, showy cars of which more is naturally made nowadays than of any other.

Roominess and convenience of use are the special features of the 1906 motor cars, to secure which there has been a very careful readjustment of design wherever there has been any possible chance for gain. That the side entrance tonneau has become thoroughly established needs no proof save observation; the whys and wherefores were thoroughly discussed a year ago. Luxury and simplicity have been emphasized on every side—"luxury" for show and comfort, "simplicity" for best action and ease of control.

To improve an already good automobile may demand a more specialized knowledge than the original construction of it. As this work has progressed, there has been a decline in the number of mishaps due to unreliable powers and broken parts. Hence a corresponding advance in the assurance one may feel in giving his machine a wider range of travel and speed. The area of the motor vehicle's use is extending principally by the growing confidence of users in its capabilities as proven in service. The real test is a motor car's ability to carry operators and passengers with comfort and certainty over the streets and highways as they are, not as the far-off future may give them to us. All other requirements than this, not even excepting speed, are less essential.

So more attention has been paid than heretofore to fitting the new models for all reasonable service on American roads, one result of which is a new popularity for touring. Comfortable, even



'NEATH CALIFORNIA'S WINTER SKIES

luxurious, equipment is the rule for the higher priced cars, and the same ends have been sought in a less pretentious way, in most of the cheaper lines. After all, the quality of an automobile consists not so much in the particular system it is built upon, as in the material and workmanship put into it.

The enthusiasm following the W. K. Vanderbilt, Jr., road race on Long Island in October has already been felt in all circles of the industry. Thousands of people who had been waiting for a demonstration before their own eyes of the power and speed of the modern car were at last well paid for their interest. While very few want cars capable of making from fifty to eighty miles per hour, there are few of us who don't like to feel—if we can afford it—that the machine under our hands can reel off a few fast miles if occasion should require.

As never before, prospective buyers are asking the manufacturers and importers for definite information as to

speed, power, expense of keeping and repairing, and the like. Almost invariably such inquiries are being met in the right way, while impartial publicity is given to the findings of practical all-year service. This is one of the secrets of the new popular confidence in motor cars and their builders. The change in this respect, even of the last two years, is remarkable, and it is laying the foundations for a development of which the present holds no means of adequate comparison.

Looking After the Wheels

Time spent in a careful occasional examination of the wheels of a car is never time lost. Each of the wheels should be examined in turn, special attention being paid to the joints at the hub flanges and also where the spoke enters the felloe. If the wheel has been built up with insufficiently-seasoned timber, it is very likely to shrink and the spokes in consequence to become loose at the nave. Should

anything of this kind be found, the bolts binding the two flanges together and gripping the spoke centers should be well tightened; the rear wheels are the ones which usually give trouble in this respect, because with these the driving strain is taken through them to the tire. Of course, the effect in this case is to pull out the spokes tangentially, also as there is considerably more side stress on the rear wheels in turning a corner, owing to the greater distribution of weight for driving purposes on these; therefore the rear wheels of a car are or should be made stronger than the front wheels. If the paint happens to be disturbed at the joints, it does not follow that the spoke is loose, but the precaution should always then be taken of feeling the nut and trying whether it can be tightened up further with a wrench without straining the bolt.

Playful Steering Jaws and Bearings

The front axle jaws or swivel pins on which the wheel for steering is swiveled are among points that require an occasional examination on the part of the owner of a car. The play in these can either be ascertained by rocking the car to and fro sideways by means of the wheels when on the ground and observing the amount of play, which is easily discernible, or by taking up the front axle and then holding a top and bottom spoke of the wheel and trying to

rock the wheel. If the play is excessive, the pin should be renewed in the open jaw steering type, and in the other type where the pin is made solid with the wheel pin a new part is there required. This latter type, however, is usually made so substantial that it rarely requires renewing in the lifetime of a car. While the front wheels are jacked up the ball bearings or plain bearings can be tried for wear; the ball races, where fitted, can be adjusted if necessary, care always being taken, however, to leave a little play, otherwise breakage of some of the balls is sure to follow. Be very careful to lock up the cones with the locking devices provided, or when running the wheel cone may either unscrew or tighten up, with disastrous result. For a plain bearing if excessive wear is found, the hub will require rebushing, this operation being best performed either by a competent repairer or by the makers of the car. Usually, when rebushing is necessary, there are other parts of the car which require attention, so that the best thing to do is to send it to the factory with a list of things requiring attention, and the whole lot can be done at once.

Must Take Risks

"Actresses don't seem to lose their diamonds as often as they used to."

"No; in this strenuous age, an automobile accident is the only thing that attracts attention."





A Scottish Automobile Tour

By Angus Sinclair

AMERICANS have always been appreciative tourists in attractive European regions. Their innate taste for the romantic and the beautiful has drawn them to Scotland in larger crowds than any other nationality. The pursuit of this line of pleasure increases from year to year.

Formerly tourists swarmed on railway trains, stage coaches and pleasure steamers, and they do so still, but they have been quick to perceive the advantages automobiling possesses in giving people the opportunity of examining at their leisure the beautiful scenery and attractive places celebrated in history, in story and in song.

It is becoming the fashion to make automobile tours through certain parts of Scotland, and some very attractive ones may be made by people having only a few days to spare. Very intimate acquaintance with the surroundings of one tour that can be made in three or four days moves me to give it a good character for the benefit of people who may take the trip.

Starting from Edinburgh, the heart

of Scotland's most romantic associations, I would lead the way farther north by Sterling and Perth to Aberdeen by the routes that give joy to the eye and play to the fancy on every mile, then away past the King's Highland home to Braemar and back through the most varied scenery to be found in the British Isles.

I have been repeatedly over every mile of the route, part by train, part by pedestrian tours and part by automobile; nearly every spot is associated in my mind with a tradition or story. Readers of *Tam o'Shanter's* ride will remember that every mile led past some spot with a ghostly reminiscence. In a similar way all my route is dotted with places that had happenings tragic, heroic and ludicrous.

I cannot linger to say a word about Auld Reekie, as its sons lovingly call Edinburgh, for to tell a synopsis of the city's story would more than fill the magazine. We start westward on a splendid road that makes the heart of the automobilist rejoice. We are soon skirting the Firth of Forth whose

waters glance at us occasionally through vistas between spreading woods and sylvan vales. One of these fine estates we are passing once belonged to an eccentric lawyer whom the people used to speak of, behind his back, as "Bags" on account of a habit he had of carrying his law papers in a green bag. One day he came upon a man trespassing on his land and went for him, trying to turn him back.

"Go to," said the man, "you'll be one of old Bags' gamekeepers. I'm going through the near cut."

"You're wrong," said the owner of

"Leeches, did ye say, dae ye think thae worms could help ma man Tam? Na, na, I put a ferrit to his side."

As we speed along we get distant glimpses of the homely looking Forth Bridge, and after passing several small villages, run into the ancient town of Linlithgow with its royal palace where the unfortunate Mary, Queen of Scots, was born.

This palace, which was nearly a fortress, was a favorite residence of the monarchs of Scotland. It was a country residence where sports and pas-



BRECHIN CASTLE

the place, "I'm old Bags himself, and if you don't get out quick I'll put the law upon you."

Mentioning gamekeepers reminds me of an incident that happened further north. A big lusty gamekeeper was prostrated with a serious attack of pleurisy, and the doctor gave very earnest instructions to apply leeches to the side of the sufferer.

Next day when he called he remarked, "I see, Mrs. Morton, that your husband looks brighter. I'm thinkin' the leeches did guid work."

times could be had away from the turmoil of the capital. It was not the intention that Queen Mary should be born here, but there used to be domestic broils between King James and his spouse Mary of Guise. After an unusually violent spat Mary hurriedly left the Palace of Holyrood and fled to Linlithgow. This family tiff is historical.

The question being put to a school class: How was it that Mary came to be born at Linlithgow? the urchins were stumped, till a bright little girl



ABERGAIKNEY FARM

answered, "Because her mither was there."

Proceeding westward through finely picturesque scenery we enter Stirling-shire, the region where the conflict for Scottish liberty was fought to the bitter end, an important success to the world for the secured liberties of this race, conserved the liberties of the Anglo Saxon people. For several centuries the kings of England exerted their whole power and energy to subdue Scotland and they were generally aided by the Scottish nobility who were the worst set of self-seeking scoundrels outside of Poland. The Scottish common people consisted mostly of small farmers who cherished generation after generation extraordinary love of liberty and were always ready to shed their blood in its defence. The kings of England resembled modern political bosses in their scheming to get control. They would purchase the nobles (leaders) and think their work was accom-

plished, but when they prepared to take possession of the spoils they found the rank and file in the field fighting against delivery.

On a wooded rising ground to our left is Bannockburn, where in 1304 Edward II assembled an army of 100,000 men to finish subduing the turbulent Scots, and was so thoroughly licked by the small army under Bruce, that it took several generations to accumulate the brawn and courage to try again. But try they did periodically until the countries were united by James VI of Scotland becoming King of England.

The poor farmers who made up the perennial fighting men of Scotland appeared to possess little to shed their blood about, but that made no difference. The spirit was there as it was with one of their descendants who was attacked by two footpads near New York and put up a tremendous fight. After he had been subdued and found worth only ten cents, one of

the thieves remarked, "By Jasus, if he'd had a quarter in his pocket he would have beaten us both."

We see before us Stirling Castle perched upon a high rock that was nearly impregnable before the days of artillery. It was one of the oldest strongholds in the country and was the scene of tragedies enough to make up a life's budget for a dramatic playwright. The magnificent view from its high turrets overlooks a hundred scenes of sanguinary strife, and vales and woods dotted with dwellings that have sheltered heroes innumerable

records of human daring or suffering that provide the warp for endless romances.

A romance-loving motorist may spend a month of delighted sightseeing on places within the horizon that stretches out from the radius of Stirling Castle. And if he found out a fraction of the things which have happened at the places visited he would be remarkably well informed on Scottish history.

But we must be moving northward on our tour which leads us through a fine valley between the Grampians



PERTH FROM KINNOUL

who have stood for principle and conscience and of many others who did not seem to have any conscience to stand for.

Near the base of the hill is Stirling bridge over the Forth, where 600 years ago the Patriot Sir William Wallace first defeated an English army. The lofty castle forms a Mount Pisgah from which, looking westward and northward, southward and eastward, a land of wonders is beheld. No finer scenic view is upon the earth, and every spot the eyes rest upon has

and Ochill hills, a valley that shows the miracles of Scots' intelligence and industry that have converted dour cold land into the finest crop-raising farms to be seen in these isles. As we spin along the Wallace monument claims attention, an uncouth tower built upon a high craig, a memorial that has little to please the eye, but is dear to every leal hearted Scot, for it aims to keep green the memory of the country's best loved hero. Dunblane, an old town with one of the finest cathedrals in the land, claims a



GLAMIS CASTLE

visit. Ancient churches, castles and houses of great renown are dotted along our route, some within view, many others hid in the recesses of the woods and mountains.

A few miles to the left of our way is a district that claims the attention of reading Americans more than

"Some auld houlet-haunted biggin,
Or kirk deserted by its riggin."

This is fabulous Drumtochty, peopled with the interesting inhabitants

created by Ian McLaren. The real region is the Borderland between Lowland and Highland, with uncertainty of expression as happens with people who think in Gaelic and talk English or Scotch, as McLaren tries to make his people talk.

"Hae ye got a licht, Donald?" says one Highlander to another. "Aye," says Donald, "but it's oot."

There is a great deal of joking in the Lowland about the linguistic blunders of Highlanders, but they are no



BLAIR CASTLE

worse than others who jump at the meaning of an expression.

During our last election I listened to a colored man who was trying to swear in his vote. He had a friend along as witness.

"Is this man related to you?" asked the judge.

"Yes, sah."

"In what way is he related to you?" continued the judge.

"His wife do ma washin', sah."

A run of 33 miles over perfect roads takes us to the city of Perth, one of

knew a good thing when they saw it and they took possession of the place. When the Scots came from Ireland and were looking up locations for settlement, they made their headquarters for a time close to Perth, and it no doubt was a good location to extend out from. They brought a famous stone from Dunstaffnage, an ancient castle near Oban, placed it in the Palace of Scone, and used it as a coronation chair for their kings. There was a legend about the stone which rhymes:



DUNKELD, FROM BIRNAM HILL

the oldest places in the land, very picturesquely situated on the princely Tay, called the finest river on the island; but one that does not appeal to Americans who know of finer streams hardly honored with a name. Most American travelers know Perth as the residence of the Fair Maid of Scott's story, just as they know Dunblane for its association with Jessie, the flower of a certain song.

When the Roman invaders first beheld the vale where Perth stands, one of their leaders exclaimed *ecce Tiber*, *ecce Campus Martius*. The Romans

"Unless the fates are faithless grown
And prophet's voice be vain,
Where'er is found this stone,
The Scotland race shall reign."

The tradition appealed so strongly to England's King Edward that when he had Scotland under his heel for a time he had the stone moved to Westminster Abbey in London, and there it remains, and on top of it is the chair on which all England's monarchs have been crowned since that day. Curious the power superstition wields.

Ever since the Irish-Scots took pos-



SCONE PALACE

session of the Perth district, some other interest has been trying to secure control, and on that account the history of the place was for many long years a tale of raids, aggression, defence and defiance. It is a wonderfully interesting old place and contains more things worthy of a tourist's notice than I could find room to enumerate. Besides antiquities it has modern attractions worthy of mention, among them its whisky. Several of the brands are favorites in the

United States, but there is generally enough kept for home consumption.

One day a party of merry boys started from Perth on a trip down the Tay. When they reached the firth the waves made the little craft toss and roll. One of the company kept holding his hand on his mouth.

One of the cronies exclaimed, "Let it up Geordie and you'll feel better."

"Na, na," was the replv, "a canna dae that, it's Dewar's whisky."

In this neighborhood a few friends



KILDRUMMY CASTLE (DON SIDE)

had been celebrating a Burns anniversary, and unsteady were the steps homegoing in the morning. One fell by the wayside and called for help from another wayfarer. The would-be good Samaritan tried to steady himself as he looked down upon the fallen one, and then settled matters



Stirling Castle

by saying, "A canna help you up, but a will lie down aside you."

Proceeding northward we follow the fertile valley of the Tay, replete with monuments of past greatness and modern prosperity. The first place that claims attention is the Palace of Scone, beautifully situated on the bank of the river with a fine background of ancient trees. A few miles further on we pass Luncarty, the scene of a great battle in which the raiding Danes met a sanguinary de-

feat. Then we pass Stanley and enter the Valley of Strathmore, the richest farming district in Scotland. To the right is a range of hills, one of them being classic Dunsinane, with the remains of Macbeth's castle. Readers of Shakespeare will remember the prophecy, "When Birnam Wood shall come to Dunsinane." Birnam hill is a bold peak to the west that I shall have something to tell about on the return journey.

A few miles on we pass Eassie, noted for an old church with historical associations. There was an old sexton connected with this church who was something of a character. One day he had been performing the last sad rites for a parishioner, when another native came up and demanded, "What do you mean by burying that man in my lot?" The sexton looked up stupefied and answered, "The Lord have a care of me, man; I thought all the time it was you I was burying."

Now we pass the ancient castle of Glamis, a finely preserved building, once a royal palace notable for many tragedies, among them the murder of a king. As we emerge from the woods of Glamis we see at the foot of the hills to the left spires and signs of a town. It is Kirriemuir, the "Thrums" of Barrie, a village of weavers, the most unregenerate and bigoted of Scots workmen.

There is a story told, not by Barrie, about an old reprobate weaver in Thrums who lay dying and was visited by a minister.

"Can I do anything for you, Thomas, to help comfort you in this trying hour? Will you let me offer a prayer on your behalf?"

"Na, a dinna believe in prayers."

"Will you permit me to read you a chapter of the Word of God?"

"Na, na, a dinna want any chapter."



EDZELL CASTLE, FORFARSHIRE

"Then, Thomas, is there nothing I can do to lighten the gloom for your departing spirit?"

"Weel, minister, as you are sae willin' to help me, ye micht get up a little argument. I think that micht help me ta slip awa easy."

Now we are passing the ancient town of Forfar, where the writer first saw the light, a town where probably the Romans got their sandals renewed, for the sutors (shoemakers) of Forfar were long famous masters of the craft.

Forfar now has a prosperous linen trade. The town has been a good representative burgh ruled by the people since Scots history began. The burghers of this and smaller places preserved their independence in spite of lordly and clerical intrigues and joined with the small farmers to fight the foes of their country.

We keep on through the middle of the Valley of Strathmore, which keeps us away from the mountain towns, the most notable being Dundee, a great jute and linen weaving town noted mostly for its chimneys, not the Bonnie Dundee of song who was the Mar-

quis of Dundee and the *bete noir* of people with covenantry sympathies.

This region was nearly all ecclesiastical property at one time under the jurisdiction of a great abbey at Arbroath, a neighboring town. Of course there are numerous roofless ruins of what once were churches; picturesque places they are in decided contrast with the bare barnlike structures where the natives now worship. In this district is a quaint old church with ivy-mantled tower, built before Catholic fanes became objects of spoliation.

There is an old pulpit in this church that had seen many changes of worshipers, but it had become rickety. One day a new, light, vigorous young preacher was holding forth in it from the text, "I come quickly." During one of his ramps the side of the old pulpit gave way and the preacher descended with a crash upon some old women who were sitting on the steps. As soon as she could regain breath, one of them was heard to exclaim:

"Lord, save the man. You kept saying that you were coming quickly,

but I thought all the time you were joking."

Presently we obtain a passing glimpse of Kinnaird Castle, of fine baronial appearance, the home of the Earl of Southesk, head of the Carnegie clan. Then we see to the right the pretty town of Montrose, on the North sea, a great golfing resort well worthy of a visit.

Through a variety of neat villages we spin, hardly stopping even at Laurencekirk, the boyhood home of the writer, situated in a garden spot of the great valley, a spot where I

brink of many giddy precipices, we cross the river Dee and enter the beautiful city of Aberdeen, locally known as the Granite City, the buildings all being of that material.

Aberdeen is a very important town, being the fourth in the country in population and finely situated between the rivers Dee and Don. It is one of the oldest seats of learning in Europe, having two famous colleges. The people have long been noted as keen traders, hard bargain drivers. Up to within a few years ago, Jews were unable to secure a foothold as mer-



UNION STREET, ABERDEEN, LOOKING WEST FROM UNION BRIDGE

always thought the leaves were greener and the crystal streams more transparent than anything to be seen elsewhere.

A few miles on we leave the valley for broken semi-highland scenery, the road leading us close to a most rugged and wave torn coast. On a craggy promontory we perceive a long cluster of ruined walls that are all which remains of Dunnottar Castle, one of the great strongholds of Scotland's warring times. A few miles more on a road that passes over the

chants. One time an enterprising Hebrew made the attempt and faced starvation for a few months. One day an acquaintance met him driving all his goods and chattels away in a small cart. "What's the matter, Isaac," asked the acquaintance, "you're not leaving us?" "Yes, I'm going. They are all Jews in that town."

There are many fine buildings in the place, including the two colleges, which are interesting to visit. It is the cleanest town I ever saw, the gray granite taking on very little grime

and washing bright with every shower. After the colleges and churches and museums, the most attractive place in Aberdeen is the New Market, a handsome emporium of shops and stalls where the natives are in their element of selling, the customers often finding that they have been badly sold. In the basement is a fish market that rivals Billingsgate in display. The place is a favorite haunt of country people. One day a neighboring shepherd was going about with his ever-present collie dog as companion. There are huge hard shell crabs found on the rocky coast, and a good supply is always in the market. The collie had been wandering among the crabs and one of them took hold of his tail, so the dog started for home and stood not on the order of his going. The fish merchant seeing dog and crab make a hurried departure, yelled to the shepherd, "Whistle on your dog." "Whistle on your crab," replied the shepherd, and the pair may still be running.

Aberdonians have the name of being close-fisted among the people of other towns. One of them who had moved to Perth was visited by a neighbor. "What kind of a person is Bain, our newcomer?" asked another neighbor who heard of the visit. "I am badly impressed by him," was the reply. "He asked if I would have a glass of whisky and began pouring it out himself, and when I said stop, he stopped."

It was my purpose to lead the trip

from Aberdeen up the valley of the river Dee, past Balmoral and away into the Highlands to Braemar, thence by Dunkeld and other romantic scenes by the Trossachs to Glasgow, but it turns out that my pace has been too slow. So I must break off with half the journey.

I shall merely mention one other incident. In times not remote a member of nearly every laird's household was the fool who was frequently more knave than fool. Near Aberdeen there is a place called Udney, and the laird had a noted fool, Jamie Fleeman. A new minister met Jamie one day and asked him, "Whose fool are you?" "I'm the laird o' Udney's fool," replied Jamie. "Whose fool are you?" One day he met a neighboring laird on the highway who said, "Where are you going, Jamie?" "To hell," answered Jamie, who happened to be out of humor. They met again in the evening, each on return journey. "Well, Jamie," said the laird, "what did you find them doing in the evil place?"

"Muckle the same as they're doin here," replied Jamie, "takin' in the rich and keepin' oot the poor."

When the Motor Talks

Every motor is designed, and later proved by test, to develop its best power at a certain speed. If there is a governor, it is adjusted to automatically regulate to that speed when left to itself. To the beginner, learning the sounds of his machine, this serves as a very trustworthy guide in teach-



A CITY OF CHIMNEYS

ing him the characteristics of its action under normal conditions, but to the driver of experience it is not necessary, for he quickly knows by the sound, when his engine is laboring and when it is racing, and can determine almost without effort the median point of best result. Very often, one might almost say generally, it is of advantage to run the motor habitually at considerably less than its rated normal speed, thus reducing noise and vibration, and enabling one to use the direct drive at low speed. This is of double advantage, since it not only quiets the engine, but gives you the full power of acceleration. But under such circumstances, even with a powerful motor and the best of carbureters, an attempt at rapid acceleration should always be accompanied by a slight easing of the clutch, to permit of its picking up its load gradually.

Mirrors for Drivers

In order to keep himself informed of cars approaching from behind, a driver who is devoid of the sense of hearing has fixed a mirror in the canopy of his car, suspending it in such a position that he can see everything that is within fifty or one hundred yards in his rear. He adds that this dodge has also "the additional and unexpected advantage of affording an exceedingly pleasant series of highway landscapes framed in the shallow oblong of the mirror."

Governing by Constant Compression

There are few very much better ways of governing a gasoline engine than to keep the compression constant by admitting the air charge for the whole inlet stroke, and varying the admission of gasoline, so as to come later and later on in the stroke as the load diminished. The difficulties of doing this are found in maintaining proper proportions of gasoline and air, and care must therefore be taken in the formation of the combustion chamber, so as to have a mixture of standard strength at the ignition point. Thorough mixing of the gasoline with the air is absolutely necessary. The advantage of this form of governing is that at light loads the mean temperature in the cylinder is greatly reduced, and considerable gasoline economy would result. The governing method of the De Dion engine is of this type, a portion of the exhaust gases being retained in the cylinder. Compression is thereby kept up to a great extent, with the objection of mixing the hot exhaust gases with the incoming cold charge, so that the compressed mixture is bound to be very hot to begin with. This contributes to a high consumption at light loads and is of course one of the best of reasons why the De Dion idea has not won many followers.





When Pneumatics Were New

By Ralph Seton-Pensky

IN view of the remarkable efficiency of pneumatic tires for road vehicles since their first modern introduction, it seems extraordinary that the original invention of them should have been allowed to drop out of sight, the more so as it seems to have given very satisfactory results from the start.

In August, 1846, considerable excitement was caused among the loungers in one of the London parks by the appearance of a brougham with most extraordinary wheels. They appeared to have tires of remarkable dimensions, but the oddest thing was that the vehicle, though quite as large and heavy as others of its class, seemed to float along the road with an easy, bounding movement, yet absolutely silent. Nothing could be heard but the horse's hoofs.

The phenomenon was found to be due to an elastic tubular ring of caoutchouc, or gutta percha, inclosed in a leather case and inflated with air to

a considerable degree of tightness. The brougham continued in use, and very soon had covered 100 miles without sustaining any damage to the tires, although newly macadamized roads had been run over. In the course of the next six months or so more than 1,000 miles were run, the tires remaining in excellent order, and the outer sheathing entirely verifying the truth of the old saying, "There's nothing like leather."

Experiments made in Regent's Park, March 17, 1847, with carriages weighing ten and one-half hundredweight, fitted, one with pneumatic, the other with ordinary tires, gave the following results: On a smooth, hard macadamized road the actual draught of the rubber tires was 28 pounds; of the iron tires, 45 pounds, a saving in power of 60 per cent. Over new broken flints these figures became, respectively, 38½ and 120 pounds, or a saving of 310 per cent. Similar experiments were made over the same

ground a few days later with the same vehicles, but by different investigators, giving on the smooth road 28 to 43½ pounds and on the rough 35 to 115 pounds. In the latter case the greater difference in results was supposed to be due to the rough flints having been a little worn in the few days' interval.

Only a common spring dynamometer was used to measure the tractive force, although much more delicate instruments for the purpose even then existed. The discovery that ease of draught could be promoted by using tires of a yielding material was considered almost more remarkable than that such substances as leather and india rubber could stand the wear and tear of carrying vehicles over common roads. Contemporary drawings show a circular fronted brougham fitted with tires some 4½ inches in diameter externally when fully inflated. The carriage has no springs, the tires being considered sufficient to remove the necessity for them, in itself a tribute to their efficiency.

The mode of construction of these tires was as follows: A thin, flat iron tire ⅛ inch thick and 4 inches wide was first placed over the felloe to bind the wheel together and afford a foundation for the pneumatic arrangement. A strip of leather about a foot wide was put around this, and upon that another metallic tire, thinner and narrower than the first. These three tires were then secured by large headed screws, or bolts, passing through them and through the felloe, and se-

cured on the inside of the latter so that they could not draw out. Next an india rubber tube was placed in position, and over that another strip of leather, riveted one side to the overlap of the first leather belt and laced to it on the other.

Means for inflation were, of course, provided. A nipple formed on the tube projected about half way through the felloe, a small tube tied into it passing quite through and projecting sufficiently to admit of a brass cup being screwed on the end on a leather washer to make an airtight joint. A metal collar sunk into the felloe served to keep the pipe in its place. The "condenser," or air pump, used seems to have been almost identical with the modern ones now so commonly used. The wheels in question, which were known as the "patent aerial wheels," were invented and patented by one Robert W. Thompson, a London civil engineer, whose patent is 10,990. It certainly seems singular that so successful an invention should have dropped out of sight so completely for such a number of years. As London was then paved with granite setts, or large cobblestones, though macadam was largely used in the newer parts of the town, the comfort and saving in wear and tear must have been far beyond what is now realized from their use on improved surfaces.

It would further appear that the present use of leather to protect the rubber portion of the tire, now hailed in some quarters as original, was somewhat antedated.



Problems That Federal Action Must Solve

By Robert Bruce

GROWING at even its present annual rate, automobile touring will very soon become an important and integral part of the passenger travel of the United States. So much might almost be said now of some parts of Continental Europe. When this point is reached in our own country, and motoring comes to be classed on a higher plane than it has been in the past or is now, there will come a readjustment of lines far-reaching in its effect. It will mean in the aggregate just about such an evolution as any other new but important development must undergo before its place is permanently and securely established.

Up to within a comparatively recent time, it might be said that the automobile had been between two opposing camps. On one side were the enthusiastic friends of the new sport and utility; on the other side the avowed enemies of the whole movement. These two forces—at first glance the problem of an irresistible force meeting an immovable body—for a long time played see-saw with each other. But gradually new elements came in on both sides.

To the camp of the early enthusiasts came thousands of conservative people who saw in the new contrivance something more than the costly playthings of wealth. These people not only drew strength from their old-time opponents, but they added a sort of needed dignity to the camp of the adherents. Utility developed from a dream of the practical minded to reality in a score of useful forms.

The evolution thus briefly sketched was too rapid for legislation to follow. This half-progressive, half-reactive side of our democratic community, collectively speaking, has never been espe-

cially noted for the accurate estimation of new movements, for perspicacity or any fine sense of discrimination. Its naturally expected attitude toward the automobile was negative, repressive—an attitude to be overcome only by long, hard work along popularly educational lines. This period is being safely passed through, and gradually motoring is coming to be regarded in a new and better light.

Experience teaches that the settlement of such questions in accordance with the exact rights of the entire community are sometimes exceedingly difficult, because of the complex considerations that are involved. A wrong ruling by a judge (and we have had a lot of it to contend with), establishes a precedent that is likely to produce an immense amount of mischief before it is reversed. In a multitude of unthought-of ways and in the most unexpected quarters, erroneous rulings crop up to breed mischief and to retard justice. When they are brought face to face with conditions that unquestionably reveal the fact that they were wrong, new and better precedents take their places. Many persons imagine that the ruling of a judge on a doubtful or disputed question of law is final. Others think that when such disputes have reached the court of appeals and been settled there that that ends them.

The fact is that the rulings of no court and no judge can, for any great length of time, hinder the march of society toward that final condition of true and exact justice toward which we gradually trend. The wise judge ever seeks to discover the inherent rightfulness that lies buried in every case that comes before him. Problems of law that have long remained unsettled are

usually such as are involved and difficult to settle. No judge, no legislature, no power in the nation can, without changing the constitutions of the various states, take from any man that which is his own without due process of law. But to maintain this principle, especially in petty cases—forming a majority of all legal actions—is difficult as well as slow of accomplishment.

Looking back from now to even five or six years ago, the change for the better is very encouraging. It is, however, not an end but a stepping stone to further progress. The next forward step is to sweep away the whole fabric of local, county, state and other legislation, and substitute therefor a simple but reasonable and strong federal law. "Too much to expect" is probably the principal comment heard in reply to such a proposition.

Considering that any useful progress is by short steps, and not by leaps and bounds, it behooves those who are interested in the future freedom of motoring in America to place their standards a little bit in advance of their immediate hopes. Let it be remembered that within the past year, largely through the influence of the automobile fraternity, but also with the aid of a broader public sentiment, the loose and often badly interpreted regulations governing the transportation of motor cars on ferry lines were done away with at a stroke, and the entire question settled by a federal statute. Considering that this statute governs local transportation by water practically throughout our country, the precedent is as favorable a one as could be quoted. Let it also be remembered that during the height of the bicycle's popularity several States, notably Massachusetts, swept away all local ordinances and substituted therefor a State law to

which there were practically no objections.

Nothing short of a just federal law will place the automobile tourist passing from one State to another in the position he has the natural right to occupy. As it is now, no one can feel legally secure in planning a tour through several adjoining States until he has sent for, digested and literally followed the legislation currently in force in each one of them. He may, for instance, send for a half-dozen license numbers and make all other preparations, and find by the time he has reached the border that a change has been made in the statute, and he must begin all over again or take the risk of trouble with the authorities. That this will be allowed to continue is not reasonable to expect of the progressive American temperament.

A condition which makes the federal law even more imperative is the fact that some of the States have a policy of reciprocity with other States, enabling the tourist carrying a registered number in one to travel through the other. Sometimes, however, this privilege is given by one State and withheld by another, a notable example of which is the fact that at present a New Jersey number is good in New York State, but a New York State number is not good in New Jersey. Then there are other States that have no settled code at present governing automobiles, which gives their citizens a very unsatisfactory standing in another State, whether the latter gives reciprocal privileges or not.

It may be reasonable to expect that within the next five years, or ten years at the most, the actual conditions in these respects will be too evident to be doubted or disputed, and that what remain of blind prejudice to the reasonable progress of the motor car will be



WHEN EVENING SHADOWS FALL

too feeble to resist the enactment of a federal statute of the right kind. The latter will take the place of all the conflicting local and State legislation in vogue to-day, giving motoring the freedom and a security impossible in any other way. Thus analyzed, the idea of a suitable federal law does not seem so far-fetched or so far away after all.

Flooding Carbureters

When the carbureter persists in flooding, the reason for its doing so will usually be found to be one of two things: failure of the needle valve to seat properly, which can, of course, be overcome by grinding in the valve, or to a punctured float, which allows a small quantity of gasoline to enter, and by destroying the balance allows the gasoline level to rise higher than it should do, and consequently to flood. This can be easily discovered by shaking the float, when the liquid can be heard inside. To find the hole and get the gasoline out is somewhat difficult, but this is the simplest way. The float should be put into very hot water, and held beneath the surface. The heat causes the gasoline to vaporize and be driven out through the small hole, when the issuing bubbles will make it clear where the hole is. The float should be thoroughly cleared of gasoline, and the hole stopped up with solder. In doing this, it is a

mistake to use as little solder as possible since the job should be done thoroughly and be cleared afterwards with fine emery paper. Of course, care must be taken not to allow enough solder to remain and upset the balance of the float, nor should you permit any of the solder to get into the float. Silver solder is better than soft solder for this float repairing. With carbureters of the Longuemare type, where a weighted needle is employed, flooding is sometimes due to a third cause. The weight occasionally bears on the seating, and does not allow the needle to seat properly. The result is that flooding occurs either continuously or intermittently when the motor running causes the vibration which shakes the needle from its seat.

Under Power Teaches Handling

Probably the best sort of training for a beginner is in the handling of an underpowered car. For with such a machine he is forced to humor his motor, to resort to every possible expedient in order to get at all decent results from it, and often in hill-climbing, even to keep it from stalling. Truly, the saying among chauffeurs that "a man who can keep a bum car agoing can drive a good car anywhere" has in it the very pith of the matter.



History in a Nutshell

By T. E. P.

THE first real internal combustion engine was the cannon, and the use in it of combustible powder for giving energy to the shot is strictly analogous to the use of the explosive mixture of gas or oil and air as at present in use in all explosive motors; thus the first internal combustion engine depended on the combination of a chemical discovery and a mechanical invention—the invention of gunpowder and the invention of the cannon.

In 1680 Huygens proposed to use gunpowder for obtaining motive power in an engine. In 1690 Papin continued Huygens' experiments, but without success. These two inventors, instead of following the method of burning the powder under pressure, as in the cannon, adopted, in ignorance of thermodynamic laws, an erroneous course. They exploded a small quantity of gunpowder in a large vessel with escape valves, which, after the explosion, caused a partial vacuum to remain in the vessel. This partial vacuum was then used to actuate a piston or engine and perform useful work.

A century later appears the first real gas engine. Street, in 1794, proposed the use of vapor of turpentine in an engine on methods closely analogous to those successfully adopted in the Lenoir gas engine of eighty years later. But Street's engine failed, from crude and faulty construction. Brown, in 1823, tried Huygens' vacuum method, using fuel to expand air instead of gunpowder; but he also failed, probably on account of the wastefulness of the method.

Wright, in 1833, made a really

good gas engine, having many of the essential features of some of the gas engines of the present day, such as separate gas and water pumps, and water jacketed cylinder and piston.

Barnett, in 1839, further improved on Wright's design and made the greatest advance of any of the then workers on gas engines. He added the fundamental improvements of compression of the explosive mixture before combustion and he devised means of lighting the mixture under pressure, and his engine conformed closely to the present-day practice as regards fundamental details. No doubt Barnett's engine, so perfect in principle, deserved commercial success; but either his mechanical skill or his financial resources were inadequate to the task, and the character of the patents would seem to favor this conclusion, both as regards Barnett and other workers at this period.

Up to 1850 the workers were few, but as time went on they gradually increased in numbers; attention had been attracted to the subject, and men with great powers and resources appear to have taken the problem in hand. Among these numerous workers came Lenoir, in 1860, who, adopting the inferior type of non-compression engine, made it a commercial success by his superior mechanical skill and resources. This stage of the development being reached, the names of Siemens, Beau de Rochas, Otto Simon, Daimler and others appear as inventors who worked at and added something to perfect the internal combustion engine and its fuel, and who have helped to bring it to its present state of perfection.

Reviving an Old Ignition Idea

Ever since the days of Otto's slide valve, with its flame conveying pocket, to say nothing of later attempts at flame and hot tube ignition, the ingenious ones have been busy trying to devise some wholly satisfactory method of firing the mixture in the gas engine cylinder. A rather novel application of an old idea has just been patented in France in which self-ignition is used, the requisite temperature being obtained by a sort of two-stage compression.

To this end a small piston is mounted on top of the regular engine piston, and so contrived as to enter a counter bore of the cylinder at the top of its stroke. This secondary cylinder, as it really is, has but slight clearance for the piston, and hence the small volume of gas which is imprisoned in it is compressed to the firing point. As the engine turns over this bit of flame is carried back to the main charge, which it explodes. Little ports are arranged in the secondary piston, so that the ignition flame is admitted to the main cylinder as soon as it has commenced its downward stroke, and the degree of compression to be obtained in the small cylinder is regulated by means of a screw, which may

be adjusted to vary the volume to be compressed.

Although there can be little doubt that it would "work," a marked disadvantage, particularly in its application to the automobile motor, would be in that the timing could not be altered to suit the various requirements of the work, and that it could never be advanced to the early point, which is necessary in all high speed motors.

What the Motor's "Knock" Indicates

When the motor begins to "knock" draw back the spark lever and see if that will not stop it. If the sound is a sharp metallic click, and cannot be stopped by manipulating the ignition, it is about time to get down and look at the pump. A "pound," to be distinguished from a "knock" by its deeper muffled tone, is due to a worn brass in one of the connecting rods, as often as not. If so, it will manifest itself most strongly when the engine is laboring on a hill, and will not appear suddenly. But beware of the thump which comes without warning and continues throughout the speed range of the motor. It stands for "something doing" in the works and will bear investigation without delay.



Three-Cylinder Advantages?

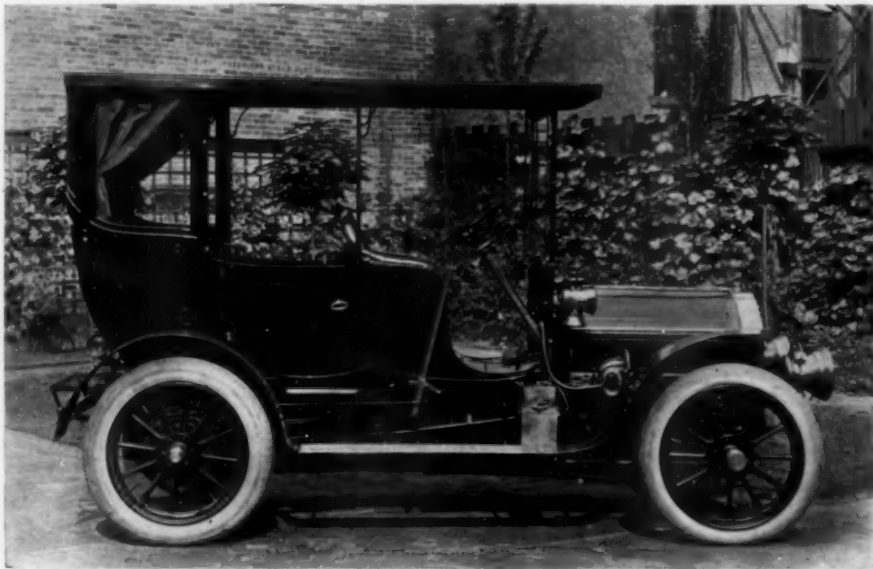
By James R. Allison

WHAT is the reason that the three-cylinder type of motor has not met with greater public favor? Certainly, so far as theory goes, it is easy enough to apparently prove that the triple cylinder has talking points in its favor which appeal to the theorist in no uncertain fashion.

With three cylinders the explosions may be so timed as to follow each other

ble, however, to have the fly wheel between the motor and transmission gear, and seldom advisable to use two in transportation work, so this slight objection must remain against this type of motor.

It is often denied by those who worship at the shrine of the four-cylinder that triple motors can have their parts in mechanical explosive balance, but



1906 40-45 H. P. PIERCE GREAT ARROW

regularly two-thirds of a revolution apart, each cylinder exploding once in two revolutions. This makes an almost constant application of power, absolutely steady, and with the cranks set 120 degrees apart. The mechanical parts are in balance, so that the motor is in perfect balance, both explosively and mechanically, so far as operation in the cylinder is concerned. When the double fly is used, the balance would, of course, be complete in every way. It is advisa-

splendid authorities, like the Panhard and Cottereau people, of France, and Westinghouse, of this country, have long disproved this fallacy in the production of some perfectly efficient three-cylinder types. This fact is readily made plain by noting the interposition of parts during a complete cycle of operation of such an engine. The results of tests by the writer, bearing out this discussion, have been most satisfactory.

The triple motor need have but a sin-

gle supply pipe leading to a single muffler, a single mixer to supply fuel, a single throttle to control the three-inlet valves, a single cam shaft to operate the exhaust and intake valves and one set of cam gears to operate the cam shaft. It is thus not much more complicated than a single-cylinder motor in operative connections and valve parts.

In this the three-cylinder has an advantage over the four-cylinder, since the latter, when operated with one muffler and carbureter, necessarily causes the cycle of operation in one cylinder to overlap with those of the consecutive cylinder. I refer to the intake and exhaust strokes when limits of efficient operation are utilized. This is why the three-cylinder types very frequently show a better efficiency in their operation than does the four-cylinder of a similar type.

Since the twin vertical motor does not give regularly spaced impulses, and the opposed-cylinder motor is not compact or simple, the triple-cylinder motor becomes the one most simple in proportion to the results obtained, or, in other words, it is of the least number of cylinders that will give multiple-cylinder results, and on this account is destined to be the ultimate form for lighter vehicle service. It may be argued that if three

cylinders are good, four are better, and six or eight better still, but this argument does not follow. While four cylinders can be fed from a single mixer, it is not advisable to exhaust four cylinders into a single muffler, for the exhaust valve is ordinarily open more than half a revolution, which would leave a possibility of one cylinder exhausting into and causing back pressure in another cylinder, of which the valve was beginning to close. Two mufflers are therefore required to get best results with a four-cylinder motor.

Since the desirable form of transportation motor is that which gives the best results, with the least number of parts, it would seem that the triple does this, for it secures almost constant application of power with the least number of parts in the most compact form. It may be arranged most satisfactorily in transportation vehicle installation. Being substantially free from vibration, it can be placed vertically or horizontally, or better yet, inclined, for if inclined it combines the advantages of both the vertical and horizontal forms.

A triple motor of 15 to 20 H. P. can be built narrow enough to be placed crosswise the vehicle and still leave room for the transmission gear in a body of ordinary carriage width. This arrangement of the transmission gear on the motor shaft is the simplest one possible, and by placing the motor near the rear axle, a short chain connects the two, so that no simpler system than this can be devised, and while it is possible to use smaller cylinders, four in number in this manner, the increased number of cylinders is not advisable, for a great many reasons when thus placed.

Why, with all the foregoing in its favor, the three-cylinder motor has not made a more successful bid for recog-



"Hi, pop! look at the dust this auto's raisin'!"
Yep, my son. Now you just watch yer dad get about twenty-five dollars' worth.



THE THOMAS FLYER AND A FEW OF ITS MANY FRIENDS

tion remains one of those things which is easier to ask than to answer.

In the opposed-cylinder type the parts are in mechanical balance, and the impulse but half as large as they would be in a single-cylinder of the same power. The fly wheel may be much smaller, and since with small parts it is customary to use shorter strokes, the speed of the crank shaft in revolutions per minute may be higher to secure any given piston speed, which is the limiting feature in the matter of engine speeds. With the opposed-cylinder form it is necessary to maintain the motor in a horizontal position. The position as compared with the vertical position is considered best for single-cylinder motors, and such authoritative practice as stationary engine construction is greatly in favor of the horizontal motor instead of the vertical, the high-priced and most practical motors as a rule being horizontal, although some first-class constructors use the vertical form.

In automobile work the length of the vehicle offers the greatest resistance to vibration, so that less motor effect is noted if the motor lies lengthwise the body of the vehicle than if it is placed crosswise or vertically. There is no denying this fact, and on this account motors should be placed lengthwise, if possible, to design other parts to permit this with equal satisfaction.

With the opposed form motor the cylinder heads are in opposite directions, the spark plugs with their wiring, the valve operating mechanism, the inlet and exhaust connections, as well as the water pipe and water jacket, must be duplicated at the opposite ends of the motor, and increases the number of parts somewhat over those required by a twin-cylinder motor. This increased number of parts not infrequently adds to the complication, and very frequently, for the rear style of hanging the motor to the vehicle necessitates placing one cylinder in an inaccessible position in

the vehicle. In some instances two carbureters are used, and even two mufflers, further increasing the complexity. In very hilly inclines one motor is, of necessity, lower than the other, which may affect the lubrication or the feeding of the explosive mixture. The great advantage of the opposed-cylinder style is that it is no wider than a single-cylinder motor of half the capacity, and on this account gives ample room for transmission gearing. It is undoubtedly the best of the two-cylinder forms, and gives excellent satisfaction when properly built. It is often placed crosswise the vehicle, although ordinarily too long for this arrangement. When placed lengthwise it is usually not possible to get it in the space under the seat, so additional body room must be provided, or else the floor of the vehicle must be placed above the motor, raising the passengers too high for comfort and safety.

One of the Salesman's Methods

There are tricks in every trade, and few industries attain to many years without collecting more or less of them. Where the automobile business is concerned, the tricks seem to be centered in large part in the demonstrating end, and doubtless they are the outgrowth of the delightful uncertainty that formerly confronted the salesman every time he brought a

prospective customer to the point of putting the car through its paces. "Will she continue to run until we get back?" was always a question of paramount importance that was frequently answered in the negative, to the disgust of all concerned.

Now there is no longer any question on this score, but, on the other hand, the buyer is not to-day the same open-minded, ready-to-be-convinced individual that he was. In the beginning it was only necessary for a car to run smoothly and every condition of a sale was fulfilled. The buyer of to-day has well defined notions of what he wants in a car, and is apt to come to the agent with the statement that he wants a "hill climber." He makes an appointment for the following day, and the agent has the car all ready for him and "fixed" to mount anything short of a precipice by the simple process of gearing way down through the substitution of very small sprockets. On the other hand, when the customer wants speed, the transformation to a very high gear is quite as simple, and both are equally well pleased without suspecting the innocent little deception. This is but one of the many and least objectionable wrinkles the demonstrator makes use of as occasion requires, accumulating a stock of varied lore applicable to the wants of each particular purchaser.



Why Gasolene Is High-Priced

By Samuel R. Penrose

ONLY a few years since gasolene was an almost unsalable by-product. In accordance with its policy of creating a demand for slow selling products the Standard Oil Company fostered and stimulated the manufacture and sale of gasolene stoves. Then came the gasolene engine, and on its heels the automobile, followed by extensive systems of domestic and municipal lighting, all employing gaso-

threatened shortage might have become a fact.

In refining crude petroleum only from 8 to 12 per cent. of naphtha is produced, depending on the gravity of the oil. From these naphthas only about 50 per cent. of gasolene can be obtained, so that the maximum production of gasolene is limited to an average of 5 per cent. of the crude oil refined. But the actual production of



DWIGHT B. HUSS, WINNER OF TRANSCONTINENTAL RACE IN NEW FOUR CYLINDER OLDSMOBILE

lene, whereupon three or four years ago the Standard Oil Company, reading the future in the conditions already existing, began to warn the public that the supply of gasolene would soon be inadequate to the demand. But this warning was dismissed by the trade and the public at large as only another "Standard Oil Scheme." Subsequently the supply of petroleum was unexpectedly very greatly increased, or otherwise the

gasolene is limited in other ways. As soon as the refiners discover that they are glutting the market on the principal petroleum products—kerosene, paraffine and lubricating oils—they cease refining. It is stated that this condition is imminent, as there has already accumulated a very great surplus, particularly of refined oil, and the refineries will not continue to make and store such surplus for the sake of producing the small percent-

age of naphthas, no matter how great may be the demand for this class of product.

The immediate remedy for the excessive demand for gasolene is likely to be sharp advances in the price thereof until the price becomes prohibitive for ordinary purposes, the high prices being maintained until the production can catch up with the demand and an equilibrium be restored. Another remedy which is being strongly exploited by the Standard Oil Company is the manufacture and sale of stoves that burn kerosene instead of gasolene. The manufacture of oil-burning engines in which the oil is vaporized in hot tubes and the resulting gas exploded similar to the gasolene engine, is also receiving the encouragement of the company. Efforts are also being made to perfect oil-using automobile engines. Makers of gasolene lighting systems for homes, stores and towns are charged with working the greatest damage in proportion to the success of their operations, because every system they install reduces the consumption of the too-plentiful kerosene and substitutes for it a product that cannot be made without producing six or seven times its volume in the kerosene which it displaces. Here, too, earnest S. O. missionary work is being done in its usual thorough fashion.

Every manufacturer will have to decide for himself how much truth is in the Standard Oil Company's warning, and every jobber and dealer who has now in stock machines and devices whose sale depends on the ready supply of gasolene at a low price will have to do the same. The premises and conclusions seem to be sound and logical, and the subject is certainly worthy of careful study and considerable thought as well.

To Tell Age by the Teeth

When it comes to picking out a second-hand machine its age, like that of a horse, may be told, at least approximately, by the condition of its teeth. In the motor's case the teeth to be inspected are those of the half-time gears, which, being in general well protected and not subjected to much stress, are quite likely to outlast many of the other parts. Therefore by studying the degree to which these teeth have been worn, it is in many cases possible to determine quite accurately the amount of service which the machine has seen. But as in the case of the horse, the condition of the teeth may be taken only as an indication of the machine's age, not as a criterion of its state of health in general.

Demands of Good Government

Although the governing of the gasolene engine is fairly satisfactory, much room yet remains for improvement. At very light loads throttle governing is apt to be somewhat unstable, and impulse changes occur in the cylinder independently of the movement of the controlling or governing lever. To produce the best possible governing, the first thing required is certainty of the proportion of combustible mixture at all speeds and with all loads. This puts the whole thing up to the carbureter. The second essential is certainty of ignition as to firing exactly at the same time, and the attaining the same maximum temperature at an equal movement of the piston. This requires good mixing, and at light loads as little mixing as possible of the combustible charge with the exhaust products in the combustion space of the cylinder. In the event of vary-



AN AUGUST MEMORY

ing the speed greatly, it also requires some accurate mode of retarding or advancing the spark to keep the diagram always rising to a maximum at the compression end of the stroke at all speeds. In most cases this is done by a somewhat haphazard arrangement. The best governing also seems to require constant compression and constant low temperature of the charge before compression. In addition to this, a governor which will not hunt, the mechanism of which must be so arranged for stability, and possibly some dashpot arrangement as to prevent the governor acting too quickly.

Slipping the Clutch for Power

The expedient of slipping the clutch slightly as a means of assisting the engine to keep up its speed for a short period when nearing the crest of a hill is well known to experienced drivers. The novice, when he attempts this trick, almost invariably makes the mistake of withdrawing the clutch too deliberately, and in consequence he often fails in achieving the desired result. To those who have so failed, the way to succeed is this:

Keep the heel down on the floor board, and tap the pedal with the toe with a rapid but not too powerful stroke. This is much better than continued pressure and it will do the trick every time.

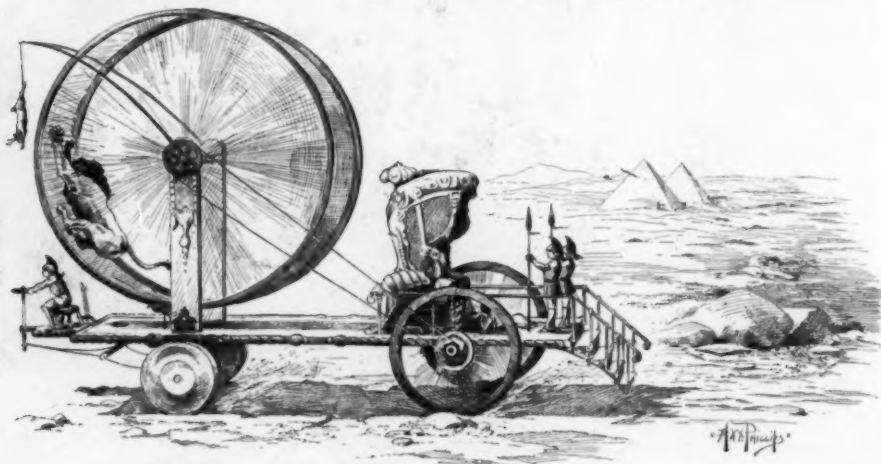
Proper Care of Carbide

Calcium carbide is very susceptible to moisture, since, therefore, it so rapidly slakes on exposure to the air, and in consequence loses its virtue as a gas producer, the supply for the lamps should always be kept in air-tight cans, and never opened except when the tanks are to be filled. Furthermore, the lamps themselves should never be filled until they are to be used, for the same reason, because the average lamp, no matter how well made, is quite apt to leak to a certain extent, and even if it does not, there is sure to be enough of air imprisoned in it when it is charged to slake the exposed surface of the carbide, thereby rendering it slow in generating when the feed is first turned on.

Made Wise by Experience

Friend—Can't you give me a tip on which is the best car?

Agent—Yes, but, in consideration of our long friendship, I won't.



THE ORIGINAL MOTOR VEHICLE

Motor Coat Cloth

By Minnie H. Mackenzie

ONE of the greatest difficulties automobilists experience in selecting a coat for all winds and weathers is to get one which will keep out rain, wind and dust, while at the same time conforming to the demands of hygiene. Leather clothing is an excellent protection against the cold and wet, and the dust can easily be shaken off it, but the doctors have condemned it on account of its not admitting of proper ventilation. Garments made from skins are even worse than leather, for, in addition to their impervious nature, they catch and retain dust and germs of all kinds. Rubber, from a hygienic point of view, is also bad.

The first consideration should be that of health, so that the automobilist in search of proper protection is driven to consider, in the first place, what material best complies with the laws of health, and then to adapt this material to resist the elements. Wool is the ideal material for clothing, and it is therefore to wool that the man in a car must look to provide him with outer clothing. A few hints about the different classes of woollen fabrics may therefore be useful in assisting him to choose the most serviceable of these.

Wool has a tendency towards felt when woven into a fabric, and submitted to various processes, and the more it felts or shrinks the warmer and more lasting it becomes. Some wools scarcely felt at all. To this class belong such as are grown in this country. Some of the Australian wools also have very low felting properties. These wools are used for blankets and the rougher kinds of tweeds which have lately become so fashionable for mo-



tor clothing. But though these materials are healthy enough, in that they allow plenty of ventilation, it cannot be said that they make up into ideal motor coats, for they allow the rain to get through, and do not resist the force of the wind. They also harbor dust and disease germs, and when thoroughly wet are heavy, unhealthy and unpleasant. The wonder is that so many motoring coats of this rough material are sold, but fashion is responsible for many anomalies, and it is not always that the most scientifically approved article is that which appeals to the public taste.

The best felting wools are those with the finest fibers, such as are grown from the merino sheep of Saxony, Silesia and parts of Australia and New Zealand. These wools make the

ideal fabrics for clothing, whether for under or outer wear, but they have been very dear of late years on account of the continuous droughts in Australia, and this has been the chief cause of the fashion for rough tweeds which has come to us from abroad.

The ideal motor overcoat should be made from fine wools. For many years, coachmen's coats and the coats of those who have to face the elements have been made from fine wool felted in manufacture into a tough leathery substance, which acts as a repelling factor against wind, rain and cold. Some of the fine old West of England cloths will be remembered by those who have worn them made up in driving coats in their horseman days, and they were so beautifully fine in texture and sleek in appearance that they were frequently called after the skins of animals, such as deerskin, doeskin, beaver, buckskin, etc. This skin effect can only be ob-

tained by using very fine wools and by causing them to felt or mat in the process of manufacture. Many of these fine fabrics are woven almost double the width they finally assume, in order that the threads may be felted as closely as possible, reducing the intervening spaces to a minimum, and giving to the material warmth, durability and rain-resisting properties. These cloths, after being woven, are boiled to give them a sleek face, and the fibers are scratched out with fine tease heads until, like a bird's feathers, they overlap each other in such a way as to shoot off the rain drops and keep dust and germs from insinuating themselves into the interstices.

Motorists should select for their clothing a material which handles sleek, like washleather, with a fine smooth face, from which the dust may be shaken. To outward appearance, it is not so warm or heavy as some inferior materials, but so closely are the threads felted together that it is really far warmer, and far more rain-repellant than a much heavier material made from coarse wools, and will last a lifetime. Such cloth can be obtained in any color, the most preferable being a light gray or dust color, or a neutral shade of drab or green drab. It is made in light weights for summer wear or in heavy weights for winter and stormy days. It can be obtained in twist or mottled effects or plain shades, but the great point is to get a smooth and leathery face. Many tailors do not care to make up this cloth, as they have in recent years learned to like the more pliant tweeds, which need so little tailoring, but the fine dressed cloth, which is made almost entirely in the West of England, will be found to answer every demand made on it, either from the standpoint of health or of comfort.



The Scorcher Type

Engine and Gear Treatment

AT the close of the summer's use of a car some of the days in the fall which are unfit for anything else should be devoted to giving working parts of the car a thorough cleaning. To do this the engine should be washed out with kerosene, by injecting it into both the cylinders and crank chamber; several turns should be given to the starting handle so as to slop the kerosene as much over the interior of the crank chamber as possible. After leaving the oil-filled cylinders stand for, say, fifteen minutes, open the drain cock and allow the kerosene to run off.

The outside of the engine should also be thoroughly cleaned. For this purpose use a stiff-bristled paint brush and kerosene, which is the handiest thing for cleansing purposes. After this treatment the engine should be wiped over with a clean dry rag. As aluminum is affected by the atmosphere, particularly near the coast, where the air is often damp and heavily laden with salt, it would be advisable, as a protection to all the metallic parts of the engine, to paint these over with a paint made from a mixture of white lead and olive oil reduced to a workable consistency by means of spirits of turpentine. This is frequently used as a protection for machine tools which are stored away or have been standing idle. Olive oil does not dry or oxidize as linseed oil does, and, therefore, is easily removable by means of turpentine when its presence is no longer required. The white lead adds metallic body to the oil, and assists it in preventing the attacks of moisture, aciduous vapors, etc.

The change speed gear should be washed out with kerosene in a similar manner to the engine. If the car has

direct drive then the bevel gear case should be filled with grease, there being no necessity to clean this out, though it would do no harm if it were washed out with kerosene, and fresh grease put in. The change-speed gear box lid should be removed, or prob-



ably in many instances it would be better to remove the top half of the gear box completely so as to expose the gear wheels contained therein, for inspection purposes. The gear shafts should be felt for slackness, and if

any motion except a slight movement endwise is noticed, they had better be seen to at once by a competent repairer. If the gears are found to be in good order and require no attention, the gear box should be filled up to the under side of the gear shaft with gear box oil or lubricating oil and grease, about one-third of the latter to two-thirds of the former.

Meeting the Season's Requirements

Most owners of cars are still driving them as hard as if it were summer, but they should remember that unless some steps are taken with a view to retaining the appearance of the car, when it comes into the brilliant light of another summer's day, the luster of its varnish and polished work will be gone, and such signs of dirtiness as are apparent will greatly depreciate its value. In the first place, if the car is not already provided with an under apron protecting the engine and gearing from mud, one should be immediately affixed. For this purpose ordinary tent canvas is one of the best materials. Linoleum can be used, but this is clumsy, stiff and ugly, and not very durable. For a chain-driven car

the apron should reach from beneath the radiator to the countershaft and as far back as the rear axle on a live axle car. To keep the apron clear of the flywheel or other projections, a light frame of iron can be made and attached to the sides of the car frame. The apron itself should be provided with straps so placed as to secure it without much trouble, and a little examination and measurement will be sufficient to enable the straps to be placed in correct positions.

Washing Down Properly

The vehicle as a whole when muddy should be thoroughly well cleaned, and the body washed by means of a hose pipe with a slow running stream, or by pouring water over those parts which require such treatment by means of a watering can. A forcible jet of water from a hose has a very bad effect on the paint, because it tends to drive any particles of grit into the surface of the varnish, thus destroying its luster. The same applies to dashing water violently from a bucket onto such painted parts. After thoroughly washing, the water should be dried off by means of a soft sponge, and then the whole polished with a soft chamois leather. Particular attention should be given to corners and crevices, and any water which may lodge there should be soaked up with the sponge and well dried. As to the metallic parts, the best treatment for these is to go over them with a painter's brush and kerosene, afterwards wiping the parts so treated with a soft cloth. If gasoline or turpentine is used for cleaning purposes, care should be taken to keep it clear of all paint work, as these liquids have the property of dissolving paint or varnish.



"We are making a hit with our new model."—Manufacturer's Catalogue.



That Baggage-Carrying Bugaboo

By "Traveller."

WHEN a tour is made in an automobile the daily trips are longer and the average speed is generally higher than in ordinary pleasure runs; therefore to avoid any discomfort of the tourists the seats must be particularly roomy and comfortably upholstered. Likewise special means must be provided for protection from the inclemencies of the weather, mud thrown off by the wheels, etc.

Unusual road difficulties are frequently encountered in touring, and a touring car must be of relatively higher power than a vehicle for town use. The majority of the better known touring cars leave nothing to be desired as regards power, so long as the engines are in good order. Where the ordinary type of touring car is more or less defective is that it does not provide room for the many things which really must be carried along on a tour. With many, an extra tire or outer cover is one of the most essential extra parts to be carried, and frequently the only manner of doing this is to strap the spare tire either to the front or rear of the body, where it is rather too conspicuous to suit the taste of the esthetic user.

In France many touring cars have been built with a Limousine body, the top of which, surrounded with an iron railing, can be made to serve for carrying extra tires and luggage. This arrangement provides a fairly suitable and inconspicuous place for the tires. In cars with ordinary tonneau or two-seated body the best place for the tires undoubtedly is beneath the floor of the body in the rear, provided that space is not occupied by some other part, as, for example, the muffler or the water tank.

Owing to the impossibility of carrying dress suit cases, etc., on some cars, it is not uncommon for tourists to send a trunk along by rail, but it is hardly necessary to say that this method is far from being ideal, though it is often the only alternative the tourist has. The luggage carrying question for touring cars can be solved in two different ways—viz., the body of the vehicle may be provided with compartments for storing the various articles it is desired to carry along or provision may be made for strapping to the car a neatly fitting trunk, readily removable. The latter would really seem to be the preferable plan, as it would allow of the trunk be-

ing carried into hotels at stopping places and would leave all the room of body compartments for extra parts and tools, which must be carried in considerable number on long trips.

Changing the Spark

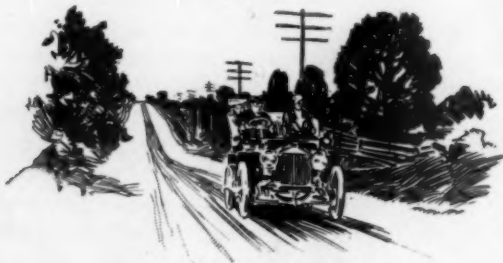
In the matter of acceleration, a very good rule is to speed the motor always, a trifle in advance of the load, but never sufficiently to allow it to race. Thus, when a hill is to be taken, the acceleration will come before the rise commences and will be gradually increased to full power, when, if necessary, the change of gears will be made before it has dropped much below normal velocity. Similarly, there should always be a slight acceleration just before the clutch is let in. When the latter is released, of course, the retardation should be accomplished simultaneously.

The speed and power may be variously controlled in one of three ways: by the quality of the mixture, the throttling of it, and by varying the time of ignition. Not to go into elementary details, it is sufficient to say that the best method of regulation is by the throttle on the inlet, leaving the mixture constant and the timing of the ignition practically so.

In some cases it is necessary to control almost wholly by the spark, since the gas valve cannot be controlled

from the driver's seat, but this should not be done unless it is absolutely necessary, since it involves heating the motor when it is run for any length of time with a late spark. There are motors so contrived that both the ignition and the throttle valve are actuated simultaneously by the governor and by the accelerator, but this method involves unnecessarily complex mechanism, and is not of particular advantage when it comes to retardation; for acceleration it is a convenience, but not by any means a necessity.

A point in the matter of retardation which often troubles beginners and those who have been used to the jump spark ignition, on first handling a machine which has magneto ignition, is that with it the motor can never be run below a certain speed without stalling. In case a motor is very nearly or quite stopped by suddenly throwing on too great a load, if it be equipped with the jump spark, the electrical energy being supplied independently, still furnishes a good spark, and on releasing the clutch, it will recover almost instantly. With the magneto, however, as soon as a certain minimum speed is reached, there is too little current generated to break a fat spark, and below that speed the system is out of action altogether. This difficulty cannot arise, however, if the proper degree of acceleration be given before the load comes on.





YOU would scarcely think that a real "literary gent" would so far condescend as to attempt to equip his unwilling Pegasus with a motor, now, would you? But I'll be jiggered if that isn't exactly about what every blessed one of them seems bent on doing just about now.

As money is said to make the mare go, so apparently is the motor expected to make the muse go fast enough to overtake the mare-moving mazuma, judging from the very latest in fiction from almost every sample of which exudes the pungent and not particularly pleasant odor of gasolene plus lubricants.

To begin with, there comes a motor-ing down the pike of fame, Mr. Lloyd Osbourne, whose name plainly betokens his nationality, and whose book "Baby Bullet" inevitably removes all doubt as its author being British born and bred: "Automobiles make the whole world—at least the whole world of automobilists—kin," declares Mr. Osbourne in his story and according to the same authority: "The automobilist has all the world against him, from the old lady in the pony phaeton to the little boy with the brick; the

great army of peripatetics are all Pyrrhonists in their contempt for the careering chariots, if not in their indifference." Small wonder then, if this is true, and we have the author's authority for its being so, that "within the devoted ranks of the Gasolene

Brotherhood there exists a feeling only comparable to the primitive church. The Panhard lion lies down with the runabout lamb; the 60-horse Mercedes scorns not the flimsy tea kettle affected by the rash and economical; the lordly Renault willingly lends its jack or its auto-clé to its lowly brother

bug. Like the proscribed aristocrats of the revolution, rank is forgotten in the common danger and the common need!"

NOW isn't that just too lovely for anything! If it keeps on, no matter whether a man cares for automobiling or not he'll have to buy a car and study it, if for no other reason that until he has done so he will be really unable to understand a goodly portion of modern fiction, since in addition to the large number of books in which the automobile is pitchforked solely to play the title rôle, no



well-regulated, up-to-date story is regarded complete to-day in which a motor car is not cast at least for one of the minor parts. The result is a dialect which makes the late and lamented language of Thrums and Drumtochty seem like a McGuffey "First Year Reader" in comparison. Mr. Osbourne talks tiresomely of spark plugs and transmission, of commutators and carbureters and ignition cams, of needle valves and radiator tubes, direct drives and sliding gears, until the man on the street is bewildered—and, unlike our erstwhile "Hoot mon" tales, no glossary is provided.



FROM things like these Osbourne and Hale ones, it is a positive relief to pick up Charles F. Lummis' "Pioneer Transportation in America" and read there: "For every joy of life there is nothing motive like Shanks' mare—and I have proved them all. Man invented legs a long time ago, and for long they sufficed him. Until he had contracted the progressive disease of civilization the 'problem of transit' touched him not at all. Did he wish to go anywhere—well, who was holding him? He had no dream of feeling abused that an electric go-devil was not in waiting to waft him five blocks. The locomotion God had given him was a 'pass over the whole system'—and no trouble to get it renewed. For every subsequent invention in land transit—with the sole exception of the horse, which made him a master and left him no less a man—he has had to pay more than the thing was worth."

Even while we may not endorse all

Mr. Lummis says about the superlative beauties and benefits of walking as a means of transport, we can at least thank him for not following the multitude of Pegasus proprietors who have thought to replace the smell of the stable by that of the garage in an effort to more readily dispose of their wares. Some one really should set these mistaken geniuses on the right road. As it is they are now motoring from no place to nowhere. The man who owns, knows and loves an automobile only laughs at the novelist's futile attempt to write entertainingly, instructively or even amusingly about the car, while the non-owner and non-admirer very properly resents the attempt of the writer to chuck a lot of second-hand junk at him under the guise of its being automobile smartness.

When a manufacturer becomes thoroughly contented with his output he has outlived his usefulness in automobiling.

MRS. LOUISE CLOSSER HALE seems to have been badly bitten with this same automobile bug and consequently she has presented us with "A Motor-Car Divorce," wherein the heroine and her husband, ten years married, are to get a divorce, and an automobile is to be "The Means"—this is the name given to the machine they buy. Mrs. Hale does not show herself so "knowledgeable" in the motor-car dialect as Mr. Osbourne, but still she or her heroine did know enough, at least when purchasing an automobile, to "get one of the very same machines the demonstrators were running. I had learned that was the thing to do when buying those little tin automobiles that go around in circles on the pavement in Twenty-third street—the fresh ones in the boxes never run at all."



DID you ever pose as an authority on anything? Well, if you haven't you have missed some of the most wonderful experiences that can come to a man. Suppose you are known to write about a subject, for example; as soon as a number of well-meaning and otherwise apparently sane people become aware of this they conclude you are an "authority," which in their dictionaries of life is translated as a man who knows it all and who is expected to sit up all night to tell all he is thought to know to every blamed fool who can get at him by telephone, mail, personally or otherwise. Right here is where the sun fails to shine for the poor devil the information chasers have made up their minds is an "authority." From morning until night, and often from night until morning the "authority" is expected sans pay, ceremony or even thanks to answer any old question any old questioner may see fit to poke at him.

As a fair sample of what these kindly souls expect of you, permit me to print here the "few facts" which the editor of a well-known technical weekly wrote me for, incidentally remarking that he was "sure either you or some one on the staff of the AUTOMOBILE MAGAZINE can give me:"

1. Number of automobiles made by American manufacturers per year.
2. Number of American automobile factories.
3. Number of automobiles which are annually imported.

4. Number of persons employed in making automobiles.

5. The capital invested in the automobile industry.

6. Number of deaths annually caused by automobiles.

7. Speed records.

8. Influence of automobiles on the good roads movement.

9. Any other automobile statistics that can be supplied.

Now when a man in the business, so to speak, expects you to answer such questions as the above, you can perhaps faintly imagine what you are expected to know and to impart to others by people whose position and training does not warrant them in properly deciding just how much a man must know and how much he must freely impart to others solely because he writes more or less understandingly about a given subject and is therefore too often erroneously dubbed an "authority."

The purchase of a cheap and experimentally constructed vehicle is like renting a door for the purpose of keeping a wolf from it.



TO every real well-wisher and lover of the saner forms of motor car construction and use, the ever increasing attention being given the industrial vehicle is a most welcome thing indeed. From the beginning it has been a stock argument of the racing enthusiast that the development of the high-powered, high-speed automobile would eventually be of great benefit to the designers of industrial vehicles. This is true, however, to but a limited extent, and the elements which

constitute a satisfactory business or military wagon must be largely worked out in accordance with the actual requirements, and not from race-gained experience. Much valuable information will doubtless be gained from properly conducted public competitive trials, and these may now well be supplemented by the putting of the successful vehicles into actual service. Questions of wear and tear, of rough usage at the hands of ignorant and careless drivers and loaders, and all the innumerable tests of working service, will reveal points for improvement and reinforcement, and it is out of such experience that the wholly satisfactory industrial automobile will be perfected. That there is an ever increasing demand for the commercial vehicle I am but too well aware, as hardly a day passes without my receiving an inquiry for such cars from people who are looking into the possibility and the advisability of substituting or supplementing horse-drawn conveyances by motor-driven ones.



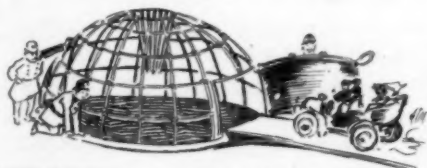
THANKS to the Sunny Jim kinds of food and the newly discovered possibilities of the gasoline tank, it cannot be denied that people can to-day travel farther, faster and more enjoyably than their forebears ever dreamed of being able to do. Along with this fact, however, has come a whole army of health cranks who seek to make the entire world but one big circus ring wherein they are the whole show. The real good, the prepared food and the improved travel methods have brought is so twisted

and distorted that the things themselves are soon forced into undeserved ridicule by the very people who actually think they are their very best friends. Anyone knows that touring by means of an automobile where roads, scenery and weather are right is one of the newest, nicest and best ways of seeing a country, but it does not follow that because this is so that there exists either a need or an advisability for anything akin to the aggregation of cranks which a French baron, Sennevoy by name, has founded under the name of "The Caravaneers." Starting with the assertion that the organization is born of the "back-to-nature" desire the Baron says he has chosen the Caravaneers by severest scrutiny from among the highest flights of society, and has made each one of the chosen solemnly pledge himself or herself to spend a certain minimum of time each year in small groups on wheels, over the country roads, "gypsying" through France, without domestics and on a fixed maximum for provisions, which the Caravaneers must cook and serve themselves.

Five or six caravans have already been built, with kitchen, salon, work and bed rooms, motorized villas for the simple minded. Baron Sennevoy, explaining the scheme, declared that while the first idea was pleasure in simplicity, there was a moral utility in the practical lessons of life learned by the amateur gypsies; it was good for a countess to wash up dishes for three weeks, and all our life would be purer if, instead of breathing the air, physically and morally unhealthy, of artificial pleasures, we would seek our happiness in nature. Perhaps the Baron is right, but I'd like to get the vote of the Countess the first night after she had finished washing the dishes and of the Count after he'd

cleaned up the car for the next day's run, before I'll be prepared to believe that this caravaneering idea is going to take, even if it is being boosted along among the French swells, by a baron, by gosh!

Ever since I was knee high to a grasshopper I have had it dinned into my ears that about the most useless thing in the world would be the fifth-wheel to a wagon. I never doubted this, but now that a very conservative French maker has placed on the market an automobile equipped with six wheels, I am beginning to doubt that five-wheel certainty. No use talking—nothing, not even the very best time-tried adage, is safe from the overpowering onrush of the automobile.



WHILE no man loves the fool automobilist less than I do, and none will more quickly hold him to scorn and punishment, yet I'll be blamed if innocent and guilty alike, the men who own motor cars, don't get an expensive lot of joblot justice handed out to them. It isn't that some of the recipients don't deserve all and even more than they get handed them, it is nevertheless an outrage that the mere fact of a man owning an automobile should be deemed sufficient to convict him on the unsupported word of any ignorant or incompetent man who for the money he can make out of bleeding the automobilist is temporarily acting as a guardian of the law. Bad, however, as the treatment of American autoists is in this connection, it does not begin to be as severe as it is in Great Britain where,

during the last twelve months, fines amounting to the enormous total of \$1,090,000 were levied upon and collected from automobilists for alleged violations of the speed ordinances alone. Some idea of the iniquity of the whole affair may be gathered from the fact that this vast sum taken from owners of cars averages nearly \$50 a car for every car which traveled over British roads during the year! How much greater the tax might have been goodness alone knows, but so severe has this imposition become that the Automobile Association of Great Britain for the protection of its members has been forced to maintain a complete road patrol whose sole duty it is to warn automobilists of the location of the numerous police traps with which the roads everywhere throughout Great Britain are plentifully supplied. Expensive as this patrol is, it has been estimated to save automobilists not less than \$500 each week in fines which they would have had to pay were it not for the warnings given by the Automobile Association's patrolmen of the whereabouts of the police traps. The most successful of these traps consists of a small cord almost buried in the road's surface at the beginning of a measured furlong. When the wheels of the unsuspecting driver's car passes over this line they automatically start a timing apparatus, while a similar performance when the end of the furlong is reached stops the timer. The elapsed time is figured out and the result leaves the automobilist but little opportunity to do anything but pay up. Wonder how long it is going to be before we have this system over here? Not long, judging from the number and rapaciousness of those rushing into the business of shaking down everyone who drives a motor car.

WHILE I am on this subject it comes to me that the French, who after all have the whole automobile question about as well in hand as anyone, have a new bill for regulating automobile traffic which has at least two excellent features in it, I think. To begin with, the tags are to be removed and the number of the car painted on the body of the vehicle, then each car is to carry an automatic speed recorder, the registry of which is to be accepted absolutely should the owner of the car be arrested for driving faster than the law permits. By the proposed changes it is hoped to separate the guilty from the innocent and to at the same time break up the numerous bands of professional black-mailers who have so long made a profitable profession of alleged timing of wealthy automobilists, followed by threats to cause their arrest and fining if money was not paid the timers. The French manufacturers intend to fight the clause calling for the painting of the car's number on its body, claiming that doing so will injure the sale and the use of motor cars. Maybe it will in France, but if the stability of the automobile industry in France is no greater than this would seem to indicate, then it is too artificial a thing to survive, anyway, and the quicker it dies the better for all concerned.

President Dave Hennen Morris, of the Automobile Club of America, in an address before the Y. M. C. A., said he knew of a chauffeur who gets \$6,000 a year. There you are! We all know that chauffeurs get about everything in sight, but even so, isn't an average of \$20 per working day just crowding the mourners a little bit too much? If the expression of the wish will not be deemed an impertinence on my part, I wish Presi-

dent Morris would let the public know the name of this \$6,000 per annum jewel. It would be an unmerited insult to this unknown to let his name be absent from the pages of history when the story comes to be written of what a good thing the automobile was to the poor, downtrodden working man! God bless his honest, simple soul!



UPON my word, there seems to be a new member born to the Society of Willing Press Workers every fifteen minutes in the day. The working must have some greater reward for the worker than the mere satisfaction of his work, since I know some of the gentlemen who conduct these bureaus, and while they are mighty good fellows and I like them personally, yet I would never make the mistake of supposing them to be flimsy flutterers, solely for the sake of educating editors. Each day the mail brings to my desk at least one and sometimes a half a dozen manifold or printed sheets, telling me how the senders do not expect me to pay them a single cent for all the trouble they have taken to tell me how the Blankety Blank car has climbed the Washington Monument faster than any other car ever did or how the Plankety Plunk runabout has run about further than any other of its kind and class has ever run on five cents' worth of gasoline and a couple of high balls for the driver. Of course, all of this is very interesting to the senders of the information, and maybe it is also profitable to those who pay the bills for its sending, who I assume are the Blankety Blank and Plankety Plunk manufacturers, but just where the man who

wants to read interesting or instructive matter concerning automobiling comes into the affair, I'll be darned if I can discover. Furthermore, I question whether money thus spent gives value returned to those who foot the bills for the flimsy makers. That others hold a contrary view is plainly evident when the ever-increasing number of those engaged in flimsy flying is considered. In fact, I was told that one concern, a new one at that, placed its entire advertising appropriation for a year, some \$15,000, at the sole disposal of one of these press working bureaus. It is all in the game, I suppose, but it really would astonish most people if they knew how much of the automobile "news" they read is ground out by aid of carbon sheets and other duplicating processes.

JUDGING from a press dispatch from there, I conclude that Springfield, Mass., has not come up abreast with the times enough to have become aware of the passing of the searchlight as either an advisable or an essential part of an automobile's equipment. According to the dispatch referred to a Springfield doctor who was proceeding on his way blinding all other users of the highway with a searchlight which he had mounted on the car met his nemesis in the shape of a poor, bewildered horse who, being unable to see where he was going on account of the blinding rays of the searchlight focussed upon his unprotected eyes, jumped right into the doctor's automobile and broke three of the medical man's ribs. It may seem a bit harsh for me to observe that the action of the horse was entirely justifiable, but I really believe that it was. Neither man nor animal should be subject to any such treatment as this uncalled for searchlight abuse begets, and the quicker automobilists

are made aware of, even if it be at the cost of a few broken bones, the better it will be for every user of the highway, automobile or otherwise. The high-powered searchlight never had, has not now and I hope never will have any place in automobiling.

I WAS introduced to a man recently who has a brand spanking new position which, between you and me, I wouldn't mind holding down myself for awhile. It is the business of this man whenever word is received of a collision between one of the New York city street railway company's cars and an automobile, to jump into the automobile provided for him, hasten to the scene of the accident and inform himself as to the extent of the damages suffered by the injured motor car, so as to be able to testify in the company's behalf if suit is brought by the owner. Motormen evidently have the prevailing anti-automobile habit in its usual aggravated form, for the new inspector told me he is kept so very busy in this automobile inspection that he no longer has time to perform certain other and subsidiary functions in the company's service which he was formerly expected to do so as to keep his time fully occupied.



NOT so long since it was thought by most of us that unless you had a chauffeur who could speak only French or Italian you were not at all possessed of the real thing in the line of chauffeurs. But it is all off now. The blight of "the yellow peril" has fallen heavily upon the

foreign aristocracy of motor car drivers. No longer is it thought to be the limit of style and capability to have your motor car man a Latin; no, indeed, to-day if you be in the very front rank of stylish motoriety your chauffeur and his companion on the front seat of your car must be liveried Asiatics, Japanese, if you please. Once you have employed these clever little men from the East it is a case of no others need apply. Clean, competent, willing and above all honest, the Japanese makes the ideal chauffeur, just as he makes the ideal servant in any capacity. Born, or at least brought up to be, without nerves, your Japanese does not become rattled when caught in a tight place; cleanly by training and inclination, both himself and his car are always spick and span; faithful to his employers, he does not steal from them himself or permit others to do so for him. Possessed of these and the added virtues of sobriety, cheerfulness and a desire to earn the money he is paid, is it any wonder that the Japanese chauffeur is the very ultimate of his class and kind?

IT is not often that your wideawake automobile manufacturer loses an excellent opportunity for free and continuous advertising, but he certainly does so when it comes to letting his light so shine before men that they admiring his good work in the cars of others may go and buy likewise. In other words, it takes a search warrant to find the name of the maker of a car ordinarily. Now good business would seem to make that bit of knowledge one which the makers would certainly see to being easily obtainable by all who seek it. Why, will some one please tell me, do not the makers of automobiles engrave their names

upon the brass hubs of a car like the carriage people do? Custom has trained people where fine vehicles are concerned to expect to find their makers' names here, and the automobile manufacturers have everything to lose and nothing that I can see to gain by not profiting by this most excellent opportunity for a quadruple advertisement upon each car which custom has so very generously offered them "free gratis for nothing."



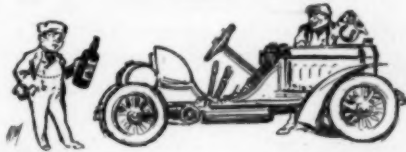
WAY down in my heart I've always had a suspicion that maybe the timing of some of our "records" were not exactly like Cæsar's wife, who was, or who at least expected to be, above suspicion. I don't mean to imply by this that I believe a conspiracy has existed whereby men in automobiles have been duly credited with moving faster than they really have moved. Not that, exactly, but I do believe that many men have not ridden as fast as the watches of those timing them have shown. The difference between what the men actually did and what the timers thought they did being attributable to incompetence on the part of the watch holders and the inferiority of the watches themselves, a combination which at its very best works rather toward inaccuracy than toward accuracy. But there's going to be a change, if the future trials of a newly invented time-recording camera prove as successful as the past trials of it have proven. The invention, which is an English one, as one would naturally expect in a land where timing

is nearer an exact science than it is in any other place in the world, consists primarily of an apparatus whereby a photograph of the car is obtained when passing a given spot at a given time, recording the actual time of the car's passing to the fraction of a second. The shutter speeds give a range of exposures from 1-25 of a second to 1-1000 of a second, while at the same time and with the same movement a photograph is taken of a watch, thus giving the exact time. A special case is provided for the watch, and in an opening above the latter a card is inserted giving the date of the timing, which card can be signed by the officer responsible for the time test. Underneath the dial is a numbering apparatus. The case is so made that after the official has placed the watch in the case, it can be sealed up, and it is impossible to tamper with the watch without breaking and destroying the seal. The record thus procured can be referred to at any future time, and certainly becomes as near absolute accuracy as anything human can come.

Advice to speed-worshipping automobilists—Don't put all of your power into the racing car of pleasure; save a little for the delivery wagon of necessity.

TO hasten the coming of the day when the automobile will do much to relieve us of the imposition and don't-give-a-darnness of the ordinary means of travel and transport, Dr. T. A. Johnson, of Xenia, Ill., has come forward with an ingenious roadway or track for use by all motor-propelled vehicles. The doctor's invention consists of two parallel tracks of concrete formed so as to present an outer flange, and a broad treadway with a strengthening rib running

down into the ballast, which has been rolled firmly in the ditches previously excavated. This roadway is designed for motor vehicles, both passenger and freight, the cars having rubber tires. The track can be used as a toll line for automobiles. The inventor has also a device which can be attached to the steering lugs of the vehicle, preventing contact of tires with flanges, and obviating all steering by the driver of the car. Sooner or later something like Dr. Johnson proposes is bound to come, and when it does there will be the greatest change in the world's make-and-get-up that this old footstool has seen since Adam was a boy.



WHEN the car owner, staggered by the price he is called upon to pay for gasolene and mentally seeking for some cheaper and equally efficient substitute for the S. O. product, has his mind revert to some of the things he has heard about alcohol as the coming revolutionizer of the motor, he wonders why it is still only coming and has not yet arrived. The range of explosibility of alcohol and air is at least double that of gasolene and air. That means that over twice as large a range you can govern the speed of the engine and the power which you wish the engine to develop by simply altering your mixture, and not until you have reduced the power to something like twenty-five per cent. of the maximum is it necessary to begin throttling. This is a very great advantage, so far as flexibility and economy in the use of fuel are concerned, and still to-day about the only vehicles which are actually run by alcohol motors are the Post

Office and Army wagons in Berlin, where the German government continues to thus prove that big cars and heavy ones can be cheaply and satisfactorily propelled with alcohol containing ten per cent. of water and about two and a half per cent. of benzol. As the patent medicine food advertiser proclaims "there's a reason," but just what the reason is that prevents the alcohol motor from materializing, unless the reason be a S. O. one, I can't imagine.

It is a pity we cannot collect power into one big jar, with a slot machine, where only twenty-five cents' worth could be obtained at a time.

AROUND Election time we always have it dinned in our ears by every cart-tail speaker that "the voice of the peepul" is the real, real thing, and when it is heard there remains nothing to do but bow to the inevitable. Bosh! The voice of the people is, as a rule, naught but the combined bleatings of the human herd driven on they know not where by the master minds that control them. The masters think, speak and act; the people speak as they are prompted, but their combined speech calls for much in addition before it can be accepted as wisdom. Let me bring this right home. Do you believe that the voice of the people, be it raised ever so loudly, should be accepted as the final dictum as to the speed at which an automobile can safely travel? Is it possible for anyone to know better the speed at which a motor car can travel, with safety to the passengers and the general public, than the experienced operators of cars? How many of the public are aware of the possibilities of brake control? The fact is not recognized by the ignorant but

none the less voice-raising public that an automobile can stop in surprisingly short distances, and that in consequence much greater speed can be permitted with perfect safety with a motor car than with a horse vehicle.

There is not an automobile club in any city in the country which, if it was intrusted with the framing of laws to regulate machines within city limits, but what would formulate regulations that if enforced by the police of those places would guarantee absolute protection for the public from all possible automobile dangers.

I do not mean by this that the members of automobile clubs are infallible, nor do I mean to insinuate that the learned councils and aldermen of the various towns and cities should bend low and with the courtesy of feudal ages say, "Honorable members of this or that automobile club, we acknowledge our utter inability to frame laws for the regulation of your cars on our city streets and therefore we humbly request that your august body frame such regulations as in your superior judgment you consider just and right." Such deference on the part of those who know nothing about automobiles to those who must know something about them is not desired by the members of any club, but it is expected that the city and town fathers should at least listen to automobile owners and users whether they are club men or not. As it is now, traffic regulations are framed and passed without consulting automobile owners, with the very natural result that when later on the regulations are found to be impracticable in many cases the prime movers in the regulations confess to never so much as having sat in an automobile, much less studied its control and guidance.

In most cities where traffic ordi-

nances are enforced the speed limit set by these perhaps well meaning but certainly utterly incompetent law-makers is ridiculously low. For an example take an ordinance which calls for a speed of 10 miles an hour at all points within city limits. If 10 miles is the limit in congested places within the business district, it is quite absurd that this rate should hold on the suburban drives where traffic is very light. Limit zones offer a solution. Keep the 10-mile limit within a radius of one mile in the business part of a city, and outside of this permit an 18 or 20 mile speed, and you will find then that not all of your citizens will be killed by "the deadly automobile." But whatever you do, don't get the idea that "the voice of the people" is an infallible rule to go by, because it isn't.

If you start to tell any one of your motor troubles, and he turns the subject and doesn't give you a chance, hunt him up afterward and thank him for it.

WE had a whole lot of stuff concerning the beauties and otherwise of municipal ownership dinned into our ears during the recent political hurrahing here in little old New York. Without adding anything more to your affliction from this source, I want to call your attention to just one thing the much-touted municipal ownership does for automobiles. In the tariff bill of fare which tells you what it costs to cross the municipally owned Brooklyn Bridge, I notice that while a two-horse team with a plug ugly driver can swear and tear his way over at an expense of only five cents, for any old kind of an automobile the price is ten cents. If it would do any good or even if I could make myself, much less you, believe

that it was something new, I might, in the mildest manner I am capable of, here observe that this savors slightly of discrimination against the automobile. But what's the use?



JUST as in former days every scheming politician sought to get the wheelmen interested in his schemes so as to use them as a cloak for his nefarious plans, so to-day it is deemed the wise thing for the politician who wants to put his hands deep into the pockets of the taxpayers to sprinkle a little gasoline over himself, to put on a pair of disguising goggles and then to loudly sound the brazen horn of falsity, proclaiming that he and his raid are for, of and by the automobilists. The cat whose paws were used to pull the hot chestnuts from the fire for and by the monkey, was a wise beast, indeed, in comparison with the automobilist who is used in very much the same fashion by the scheming politician anxious to feast upon the nuts of patronage hot and smoking in the pan of practical politics. To the credit of the cat is must be said it did not willingly engage in the nut-abstracting performance but succumbed only to the superior force of the monkey; with the automobilist, however, the case is different, he likes the part he plays, he pulls the golden fruit out of the fire, for the wily politician pays, mind you, pays, for the privilege of doing so, and then rejoices in the burns he receives in the course of the performance. Isn't it enough to make a cat laugh?

But what is it that makes otherwise conservative and sound business men

lend themselves as the well-meaning tools to sharpers in affairs like this? You'll have to supply the answer, I can't. Take this proposed plan of handing over \$50,000,000 of real money to the politicians to build improved roads in New York State with, for which proposition automobilists are being urged to support with their influence and their money, could anything be less likely to result in a public scandal and plunder of the taxpayers? Certainly not. Politicians are the natural enemies of all reform, no matter whether it be road reform or not, and does past experience in the same direction lead any sane man to suppose that the politicians will put any but the smallest possible amount of that \$50,000,000 any place else than where a politician always puts any dollars he has control of—in his pocket? No, indeed. I am in favor of good roads everywhere and every time, so is every other man except the farmer and the politician; these never were and never will be in favor of building or maintaining any other than the worst highways that the taxpayers will stand for, as the streets and highways of this country almost everywhere bear evidence. These trans-continental boulevards and these \$50,000,000 State road schemes are the golden chestnuts that the politicians seek to have the automobilists pull out of the fire for the politicians. It speaks volumes for the willingness of the automobilist to see to what length he will go when the good roads bait is dangled in front of him, though I must say that one very small volume indeed would not be at all crowded with a record of the good roads he has actually built as a result of his acting as the politician's foolish catpaw in such matters as the ones I have noted. To my mind

the less automobilists lend their names and influence the better it will be for the automobilists. Concerning this proposed \$50,000,000 scheme which automobilists were begged so hard to support, my ideas are exactly those set forth by Mayor George B. McClellan, an able man and an honest one, who said:

"After our experience with the \$10,000,000 appropriated for the improvement of the canals, I submit to you whether you think it wise or prudent to intrust those in control of the affairs of this great State with the expenditure of \$50,000,000 to improve its highways. You remember the scandal, the corruption, the stealing which accompanied the expenditure of that money. The adoption of this amendment would bring joy to every dishonest contractor, every corrupt highway commissioner and rotten town politician in the interior of the State."

Automobiling has its share of "Smart Alecks," but even in it no one has ever seen a really smart "Smart Aleck."

CERTAINLY the automobile is a most deadly thing! Everybody knows this because about every newspaper on God's green footstool is busy every day telling us all about it, and of course the newspapers are always right. I hardly dare in the face of all this to bring forward a few statistics which have no more reliable foundation than that they are compiled from the list of casualties extending over the past twenty-four months upon which the most conservative of accident insurance companies has paid out hundreds of thousands of dollars in indemnities to its policy holders. Daring, then, to fly in the face of Providence and the never-mistaken press

and public, I would like to say that these insurance figures show that 12 per cent. of all the accidents to people in cities happen on the streets, where the average citizen, if he should meet with one hundred serious mischances on his walks abroad, would find their average out in this fashion.

He would slip on the ice, and fall down under other circumstances, sixty-eight times; he would get hurt ten times in boarding or dismounting from cars; he would be knocked down, or otherwise injured by horses and wagons six times; he would be bitten by dogs four times, and he would step disastrously upon banana peels twice. The remaining mishaps would be miscellaneous, and might include one or even two collisions with motor cars, but not more. Certainly the automobile is a most deadly thing indeed, as these figures show, and we should be indeed thankful to the mighty press and the ever considerate public that combined they permit so deadly a thing as an automobile to even be made, much less used.

After all, when you have bought a second-class vehicle, what a blessing it is that subsequent regret doesn't interfere with present pleasures.

WHEN the trolley car was introduced loud and long-continued cries went up that the speed should not be greater than that of the horse car, whose slowness had been the prime reason of the electric's introduction. A few years were needed to educate the public to the electric street car, and now you rarely hear of the excessive speed of the cars. If we go back only a few years further in the world's history we will encounter the wailings against fast traveling that arose with the introduction of steam and the railroads. More recently when

the bicycle was filling every open space on park drives and boulevards the cry against scorching almost reached the clouds. It is not at all surprising, then, with the coming of the motor car, there should follow a resurrection of the old-time cry, "Less speed! less speed!" It cannot be denied that some drivers dash along at a pace that is dangerous to all on the thoroughfares; it is also true that for every automobilist who thus violates the rational rights of the public there are hundreds who go to and fro day in and day out without the slightest danger to any person.

It has been clearly shown by the daily press that the law evaders and accident makers are not often owners, but almost invariably reckless chauffeurs who are out for a good time without either the knowledge or the consent of the car owners. The punishing of such a class rests with the owner of the car who, if he cannot control his chauffeur, should then be held responsible for the acts of his hired servant. There are now on the market devices that can be attached to any car by the use of which any driver can in a moment discover the rate at which his car has been driven, so the time-worn and baby-like excuse of I didn't know I was going so fast, no longer has any standing either in court or out of it.

The President's gallant remark that he would run over a man any time to shake hands with a lady should make the country mighty glad that so far the President has not taken very enthusiastically to the automobile, because should he happen to want to shake hands with a lady when he was in a car the result for any poor man who happened to be in his way would be decidedly unpleasant, if not worse.

If you will fight you'll make your pile,
And if you don't, you won't.

"The Lord helps those who help
themselves."

The Lord help those who don't!

SAY what you will about him, and you can perhaps say a lot that is not complimentary, you cannot truthfully say that with his faults, many or few as they may be, your Briton is not the greatest sportsman in all the world, for he is that first, last and all the time, at home or abroad. When it comes to the way the British automobilist has been prosecuted, persecuted and in every way possible harried by the law and its guardians, you would think that even he would have about concluded that the game was hardly worth the candle and would therefore have let up on automobiles until returning sanity had induced magistrates and police in their turn to have let up on the automobilist. But no, indeed, your Britisher finds the new sport to his liking and nothing under the sun can make him give it up until he finds something he likes better with which to replace it. I couldn't help thinking of all this when I was looking over the official figures which showed that in spite of all the French government has done for automobiling there, there were but 21,324 automobiles, big and little, in France as against 17,107 owned there last year and 12,984 in 1903. In Great Britain, despite governmental, magisterial, police and private attack, there are registered in London alone 13,634 motor vehicles, while Paris has but 4,067 to her credit. Conservative estimates place the total number of motor vehicles now owned in the United Kingdom, which in this case virtually means England alone, at 40,000. As

I said in the beginning, you can't rob an Englishman of his sport, do what you will, and the above pretty nearly proves that so far as automobiling is concerned this statement is absolutely correct. When you look at the figures I have given, how long do you think the Mrs. Partingtons of British anti-progress are going to continue sweeping back such a mighty tide with the penny broom of prejudice?

"Pretty fine work," exclaimed the counsel for the automobilist as the Long Island "jedge" imposed one of \$75 for alleged fracturing of the speed ordinances.

DID you ever stop to think what a very uncomfortable position the passengers in a rapidly traveling motor car would find themselves in if from any cause they were to unexpectedly lose the services of the only one among them who knew how to handle the car? Suppose, and it is quite within the realm not only of possibilities, but even of probabilities, that the driver was suddenly stricken with a fatal illness or even with such a temporary incapacity as vertigo might produce, how do you think the passengers rushing along at railroad speed in a vehicle they might perhaps know enough to direct, but did not know how to stop would feel? Of course to most of you who read this the idea that anyone could be so stupid as not to know which was the proper pedal to use or even how to switch off the spark in such an emergency as I have outlined seems almost inconceivable, because to you the thing is really almost a second nature. But even you one day knew as little about the control of a car as most people still know, and I tell you that idea I have dealt with above sug-

gests no very pleasant line of thought. I believe that it would be a most excellent thing for every car to have, where it would always be in plain sight and easily accessible to its passengers, a switch conspicuously marked showing how it should be used in case it became necessary for the passengers to stop the car when for any reason it might temporarily have become a runaway.

Next to the personal or "agony" columns of a New York newspaper no portion of its advertising affords more interesting reading than the lost and found advertisements which show how many and varied are the things which go astray in a big city like New York. The limit of lostness, however, seems close to being reached when an advertisement appears offering a reward for "three sightseeing automobiles, two with a capacity of 40 passengers each and terraced, one 24-passenger capacity." Imagine three little objects like these straying away from their owners and requiring an advertisement to help locate them, if you can!

WHEN you come to think it over does it not seem to you that after all the fairest way to tax automobiles, since taxed they must and will be, is do so upon each unit of the car's horse power? If this idea was carried out the man who had the most money, or who at least used the most in buying an automobile, would pay the most in taxes on it, as he should, while the little fellow, the man with a single horse power bank account would get off for less money. Another good thing which would result from such rational taxation as this would be the premium it would put upon the building and buying of cars driven by rational power. Fur-

thermore the taxing of horse power would make certain that the purchaser of advertised horse power could receive it, since the owner of the car would make the builder of it prove that he gave the owner actual power the tax assessor said he must pay for. Under conditions of this kind I can see a whole lot of twenty horse powered cars that not even so hardhearted an individual as the tax assessor is thought to be would have the nerve to flatter with the allegation that better than fifteen horse was actually present.

WHY the three-cylinder motor has not met with more success in automobile construction is a thing a lubber like me has difficulty in determining. In other lines where the generation and employment of power is and has been a far more exact science than it has yet become in automobilizing it is an axiom that the larger the number of cylinders for a given power the less the economy of the motor, due to loss of heat through the walls and the added friction per horse power. In other words, economy is gained by decreasing the number of cylinders for any unit of power. Accepting this as true, since the triple-cylinder motor gives all the advantages of any multiple-cylinder motor almost perfectly, it has always seemed to me that there was absolutely no reason for the motor makers to increase the number of the cylinders for the lower powers. Of course, somewhere or some way there is a fault in this logic of mine, but, as I said in the beginning, I being a lubber cannot be expected to know just what the fault is, nor where.

About the only good thing some automobiles have is their reputation for being bad.

COMING events cast their shadows before them; coming balloons cast their shadows beneath them. The shadow of the balloonatic has fallen upon the Automobile Club of America, and now a hundred gentlemen there, none of whom ever owned a balloon, and most of whom never will, have formed the Aero Club, and have already been lectured to by gentlemen who know everything about flying except how to fly. Despite all this the new club is bound to do a lot toward moving the new sport for high fliers right out into the bright blue ether where all may see it even if only a few may actually indulge in. Heretofore the traveling of the air has in this country at least been a thing left almost entirely to inventors and fakers, neither of whom really did much aerialing, though both of them were sure they could do so if—. Now the new club, composed as it is almost entirely of the most energetic and wealthy members of the A. C. A., will lift the subject out of the mud of disrepute and give aerial navigation a chance to win out on its merits—if it really has any. Just at present the new club, as quite befits its name and cause of being, is all up in the air as to just what methods it will pursue to hasten the coming of the day when the air line express will mean something quite different from what the same expression does at present, a thing that I am sure there is none who does not wish them every possible success the same as I do.

In the history of great mechanical inventions I don't think there is a better example of the interdependence of the engineer, the physicist and the chemist than is evinced in the perfecting of the gas engine. The physicist and the chemist together deter-

mine the behavior of the gaseous fuel, basing their theory of data obtained from the experimental engines constructed by the mechanical engineer, who, guided by their theories, makes his designs and improvements; then, again, from the results of the improvement fresh data are collected, and the theory further advanced, and so on till success is reached. But though I have spoken of the physicist, the chemist and the engineer as separate persons, it more generally occurs that they are rolled into one or, at least two, individuals, and that it is indispensable that each worker should have some considerable knowledge of all the sciences involved to be able to act his part successfully.

Even in the trade there is less room at the top than is popularly supposed. Those who are there are few, but they are quite large to fill all available space.

WELL, thank goodness there has been found one thing the automobile has not ruined! True, it is not a very important industry, but in a matter of this kind we must be thankful for any favors, no matter how small. In Europe the wig makers are blessing, mind you, actually blessing, the automobile for booming their business. The wiggers say that the vogue of the motor car and the favor it has met with among women has induced the fair sex to guard their own natural locks from the dire effects of dust and dirt begotten of the car's rapid progress, by the addition of an artificial wig or half wig, the latter being the more popular accessory of the two, and the making of these are keeping the foreign wig makers working at night.

While the nervous man in a car is a bore and a nuisance, he is positively charming in comparison with the nervous woman in the same position.

FROM a really practical, get-the-money point of view I don't know of any man in the automobile publicity promoting game to-day who has as long and as unbroken a record of success as Robert L. Winkley, a gentleman I have known ever since the good old bicycle days when he did such yeoman work in making the name of Columbia bicycles literally worldwide. To those poor unfortunates who lay the blame for their own failures upon advertising in general, when the fault is not with it but with themselves, I would especially commend this bit of sententious wisdom uttered by Mr. Winkley in the course of a recent address made by him: "To blame advertising for the failure of some advertising is as unjust as to hold flour responsible for the failure of some flour maker. The advertiser, instead of the advertising, is generally to blame for the failure. I have never known any exploitation to pay which was not considered a part of the business proposition. Advertising, unless made a part of business, is valueless to business."

In accordance with the generally accepted idea that the man engaged in making candy does not eat bonbons, I suppose the fact that John D. Rockefeller's entrance into automobiling as the owner of a steam, not a gasoline, vehicle is to be explained. At that you'd rather expect him to be of the gasoline, most gasoline, when it came to making a selection, now wouldn't you?

Ordinarily I read trade literature with about the same degree of pleasure that I take a quinine pill. In both cases I recognize that the act, while not highly enjoyable, is for my good and so proceed to get through with

it as expeditiously as I can. There are exceptions, however, to the trade literature task which there are not to the quinine swallowing one, and when I run across these exceptions you can be sure I do not fail to enjoy them. One of the best of these is the story of "The Royal Transmission of Tucker," a tale of the Vanderbilt race, written by George H. Bowler. If you want to read something which is mighty close to perfection in the line of sugar-coated advertising, introduce yourself to Mr. Bowler and ask him to introduce you to Tucker. You'll not regret it.

One measure of a man's ability to become a genuine automobilist is the length of time it takes him to find out when he is wrong.

ACCORDING to one of those writers who devotes his time to telling people how easy it is to do anything, the timing of a fast traveling motor car is exceedingly easy if you can only do about six different things at once. Here is the way of doing the timing according to its discoverer: "Watch the approach of a car, and when it passes note where the second hand on your watch points. Then wait until twenty or so seconds have elapsed, and this time note the position of the car. The distance from where the observer stands to that point where the car was last noted is then paced out and the distance found. Whereupon it is very simple to calculate the number of miles per hour at which the car was traveling. Of course, the result is not scientifically correct, but it is near enough for most purposes."

It takes so much money to keep in repair a cheap and unknown make of vehicle that no owner of one can hope to save enough for a trip to Europe.

THAT class of newspaper liar who formerly employed his talents in writing of the sea serpent and such like, has now come abreast of the times with yarns like this: A Swiss engineer has patented and successfully employed what he has termed "motor boots." These get-over-the-ground-quicks are nothing but a pair of heavy shoes, each of which is nothing more nor less than a miniature motor car mounted on four wheels of about one foot in diameter. The user's two feet work quite independently of each other, and should one motor break down the other will carry the traveler along without difficulty. The motor boots are said to be exceptionally light, compact and strong, being driven by gasoline on a new plan, which the inventor keeps secret. It is claimed that an ordinary pedestrian equipped with this Swiss invention can travel all day over average country roads at a pace of twelve miles an hour without experiencing the least fatigue. The boots can be started or stopped in an instant by a spring attached to the belt of the one using them.

When some sudden emergency causes the driver to jam on the brake, the passenger sitting beside him, unless prepared, is more than likely to be thrown against the screen. Front seat passengers narrowly escape being thrown right over the bonnet on to the road, when the driver brakes up suddenly to avoid an obstruction. Then again, in case of stones being thrown at passing cars, as is done in some localities in this free and enlightened land of ours, there is considerable danger of the front seat occupants being cut by broken glass. Remember all of this when the honor of being the driver's companion is conferred upon some one else and it is a case of to the tonneau for yours.

There is a time to bluff and there is also a time when common sense should teach a man the utter futility of pretending he holds in his hands cards his opponent, no less than himself, knows he does not hold. One of these non-bluffing times is when you are arrested, rightly or wrongly arrested it matters not, charged with breaking the local speed ordinances. When this happens please don't get off that battered old bluff to the officer of "I'll have you broke for this outrage, you see if I don't." There is not a case on record where this bluff was ever made good, so what's the use of trotting it out when your ill-fortune or bad behavior causes you to be haled before the bench?

Our pride in our automobile possessions depends upon what our friends in the same line haven't got.

THIS doing the grand tour per automobile is no longer to be confined solely to millionaire car owners. An English concern has started a regular motor car service over the perfect roads of France, asking a price for the tour which, while it is not quite as cheap as that paid in a trolley car, is still quite moderate when compared with what it costs a millionaire to scorch over the same route. The vehicles, sort of a tourified rubber-neck affairs, carry thirty-four passengers from Dieppe through all the most picturesque scenery and chief towns of France to Monte Carlo. The trip takes a whole month, and the cost of the tour, including first-class hotel accommodation, is only \$250.

Some people can be made to believe anything about an automobile except that they don't know everything about it.

THE OUTSIDER.

The Automobile Magazine

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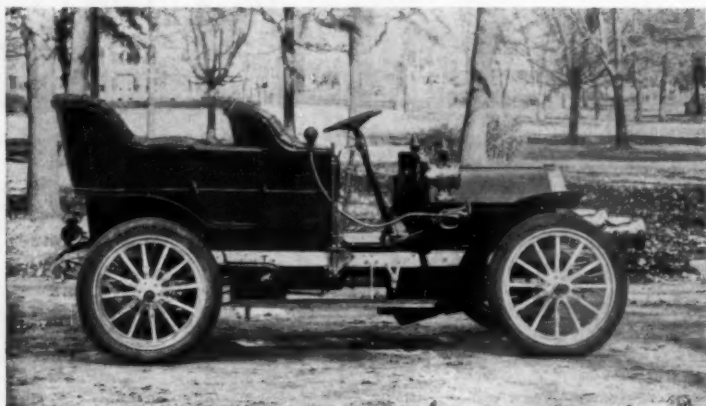


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 WALTHAM—Harvard Auto Corporation. S. R.
 WESTFIELD—Loomis Automobile Co. S. R. C.
 W. MEDFORD—P. H. Greaney, 439 High St. S. R.
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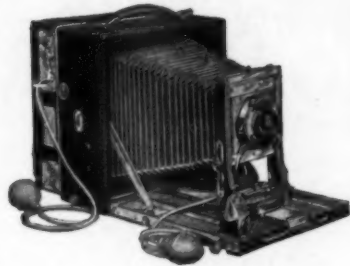
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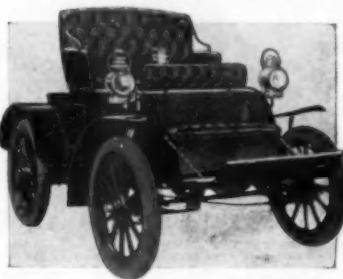
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The Landaulet, " " "	5,000
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The second mechanism is the 24-28 H. P. four cylinder Chassis, side entrance,	
King of Belgium type Tonneau,	3,500
The third mechanism is our well-known single-cylinder Stanhope, 8 H. P.,	
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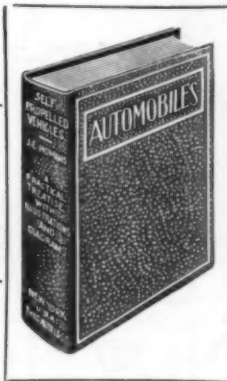
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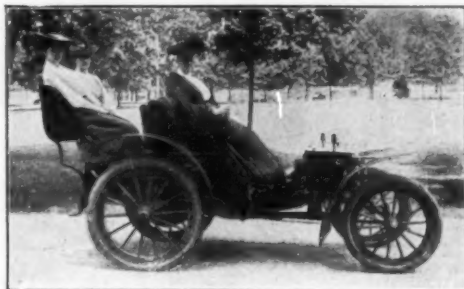
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Double Side Entrance Body

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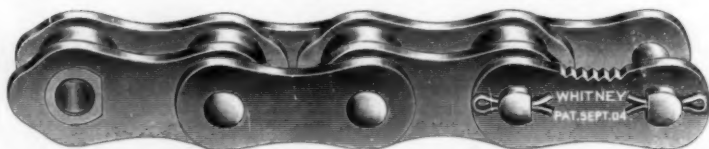
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 TYPE**



**COTTER
 DETACHABLE
 TYPE**

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Nothing created by man has ever equaled the performance of the standard Packard car, which on August 6th to 8th ran 1,000 miles without a single motor stop at a sustained speed of over 33½ miles per hour. Instead of needing repairs the car ran better at the finish than when the trial was started.

Since the completion of the test this particular car, without the slightest attention from the factory, has had over five thousand miles of road driving with surprising track demonstrations at Buffalo, Long Branch, Providence and Philadelphia, and proved most conclusively that not only is its design right but that the materials and methods used in its manufacture have successfully solved the motor car problem.

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REQUIRES LESS POWER
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NO FEAR OF A FLAT TIRE.

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The Incomparable **WHITE** With Limousine Body For Winter Use

Body detachable and readily replaced by tonneau



Seats Six People
Four Seats Inside

Price, \$3200

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FOR EVENING USE**

No Noise
No Vibration

Sales Offices in all Principal Cities

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ALL that has been accomplished during the past year towards bringing the automobile nearer to perfection is exemplified in the COLUMBIAS for 1905. Leading models include our new 40-horsepower gasoline car in side entrance Tonneau, Victoria, Landaulet or Limousine styles; our new 16-horsepower side-entrance gasoline Tonneau (class winner in the Eagle Rock hill-climbing contests, November 24th); our new light electric Victoria, the handsomest and most efficient vehicle in its class ever constructed, and our standard electric Runabout, Surrey, Town Carriages of the coach class and electric Commercial Vehicles.

We issue three Catalogues describing respectively Columbia Gasoline Cars, Columbia Electric Carriages, and Columbia Electric Delivery Wagons and Trucks.

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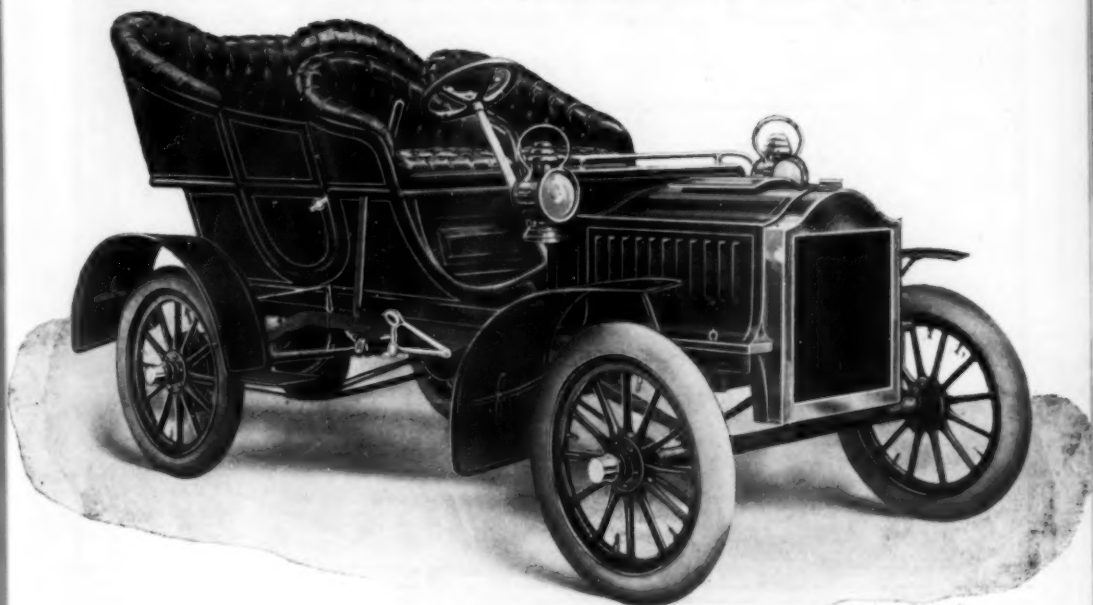
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OLDSMOBILE



TOURING CAR

Price, \$1400

TWO-CYLINDER

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SIDE ENTRANCE

These cars 'meet a distinct demand—they give extreme comfort—surplus power on hills and speed on the level. The right car at the right price. A speed of from 6 to 40 miles an hour is easily attained. Has seating capacity for five passengers. Wheel base, 90 inches. Motor, 20 H. P.; double opposed cylinders, $5\frac{1}{4} \times 6$ inches. Noise of exhaust completely eliminated.

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**World's Championship and
World's 10-Mile Track Record**
Peerless Green Dragon,
By Barney Oldfield, 9:12 3-58.

World's Track Records
Peerless Green Dragon,
By Barney Oldfield

1 Mile	3:52 1-5
2 Miles	7:51 1-5
3 "	2:47
11 "	10:18 1-5
12 "	11:15
13 "	12:12 1-5
14 "	13:09
15 "	14:03
20 "	19:52
25 "	23:38 1-5
50 "	48:39 1-5

**World's Track Record, 5 Miles,
for Light Weight and Middle
Weight Cars**

Ford Racer, By Frank Kulick	
First Mile.....	59 th
Second Mile.....	57 2-58.
Third "	56 4-58.
Fourth "	55 1-58.
Fifth "	55 1-58.
Total.....	4:43 3-58.

**World's 1-Mile Track Record
for Light Weight and Middle
Weight Cars**

20-H. P. Ford, By Frank Kulick, 55th.

**World's Track Records, 6 to 25
Miles, for Stripped Touring
Cars**

Peerless Blue Streak, By Chas. Burman	
6 Miles.....	6:24
10 "	10:40
15 "	16:02 2-5
20 "	21:24
25 "	26:50 1-5

**World's 5-Mile Track Record
for Touring Cars**

Pope-Toledo,
By B. F. Dingley, 5:09 3-58.

**World's 1-Mile Track Record
for Touring Cars**

Pope-Toledo,
By George Fuller, 1 3-58.

**World's 10-Mile Track Record
for Touring Cars**

Peerless,
By Barney Oldfield, 10:30 1-58.

The invincible OLDFIELD on
G & J Thread Fabric Tires
breaks all world's track records
from fifteen to fifty miles at
Fresno, Cal., Dec. 13, on
Peerless Green Dragon:

15 Miles	-	-	14:03
20 "	-	-	18:52
25 "	-	-	23:38 1-5
50 "	-	-	48:39 1-5

Every week brings added proof
of the great speed and durability
of G & J thread fabric tires.

We would like to tell you more
about them. Write us.

We shall exhibit at the New
York, Chicago, Boston, Cleve-
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Warrant
to His
Majesty
The King



Over
50 Gold
and Prize
Medals
Awarded



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"SPECIAL" and "WHITE LABEL"

(The Fine Old Highland)

(The Whisky of Great Age)

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American Motor League

IMPORTANT

The American Motor League will hold its annual meeting at New York in January, and an adjourned meeting of its members at Chicago in February. These meetings occur during the weeks of the Automobile Shows in these cities. Reduced railroad rates have been granted to A. M. L. members attending these meetings, and these reduced rates will be granted only to members of the A. M. L. Full printed information will be sent on request.

The American Motor League is now collecting and compiling route information from all parts of the country, and will print Road Books for ten important States as soon as this information is completed. The League also proposes to establish a Route Information Bureau, from which information will be sent out to all inquiring automobilists by an expert employed for that purpose. The A. M. L. is the only organization which permits individual members (not members of clubs) to be represented by delegates at League meetings.

Recognized Automobile Clubs are received into the League on payment of a nominal fee only.

There is no initiation fee. The annual dues paid by each member is two dollars.

Full printed information relating to the League, and its object, will be sent on receipt of postal-card request.

American Motor League

Vanderbilt Building

New York City

The Old Reliable Waterless KNOX For 1905

Higher in Quality—Lower in Price



Superb in Style and Finish

The new Knox 1905 two-cylinder air-cooled machine is as quiet and as smooth-working as any four-cylinder machine, with less than half its complications.

14-16 H. P. Side Door Tonneau	- - -	\$1,900.00
14-16 H. P. Convertible Surrey	- - -	1,750.00
14-16 H. P. Folding Front Seat Runabout	- - -	1,500.00
Single Cylinder Folding Front Seat Runabout	- - -	1,250.00

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Waterless Knox Automobiles awarded **GRAND PRIZE** at Louisiana Purchase Exposition

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DELIVERY WAGONS

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1905 CHAINLESS WOLVERINE

Every part accessible; speed; plenty of it; safe; a hill climber;
2 models, "C" and "D;" Model "C," Rear Entrance Tonneau.

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New Catalogue, Department "G"

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OPEN END, . . . 1.00



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Both guaranteed 90 days.

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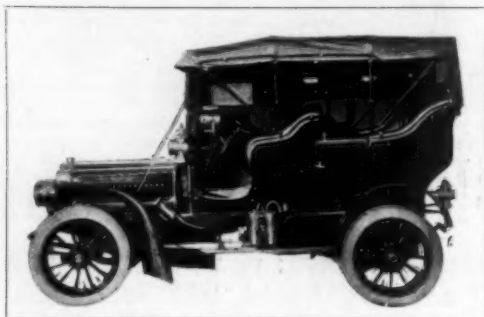
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NEW YORK

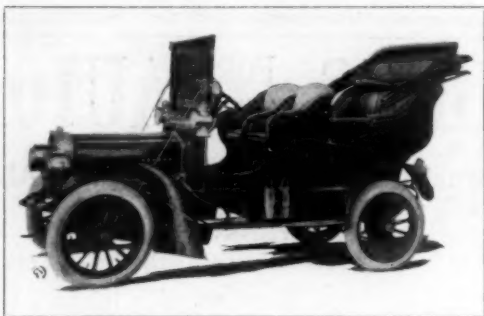
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One of Col. Sprague's Cape Extension Tops with Glass Front



One of Col. Sprague's Cape Extension Tops closed down, leaving the glass front as a wind-break. The "Thomas Flyer" and many others will be equipped with these tops

See Our Novel Exhibit at the New York, Chicago and Cleveland Shows

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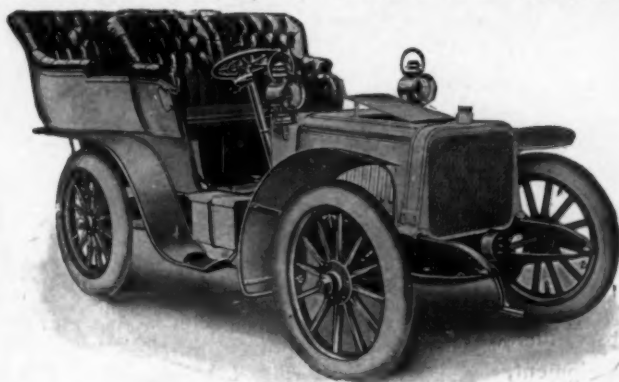
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Leaders in Style, First in Records



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1 Kil Flying
29 2/5
1 Mile Standing
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40 SECONDS

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5 MILES OPEN
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15 MILES SPECIAL
— FIRST —
SYRACUSE SEP 12
10 MILES OPEN IN
PROVIDENCE SEP 10
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PHILA OCT 10
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— FIRST —
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OCT 12
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5 MILES FOR
Gentlemen Open 1912
5 MILES open for
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"IT STARTS FROM THE SEAT"

Automobile virtues are combined in our car to a rare degree.

Price at factory, including complete equipment,

\$1300

ILLUSTRATIONS and detailed descriptions of our popular model runabout, including full explanation of mechanism, etc., and history of our Record-breaking Car embodied in our new catalog. Send for it. Mailed FREE.

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The Automobile Magazine

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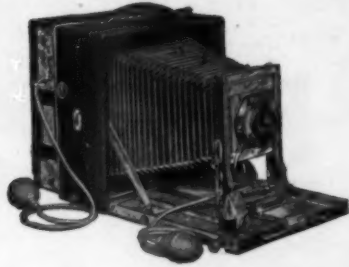
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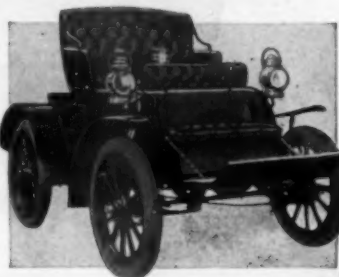
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 TACONY—Jos. M. Smith, 3503 Long Shore St. S. R.
 WAYNE—R. W. Loundis, 116 E. Lancaster Ave. S. R.

RHODE ISLAND

NEWPORT—New York Automobile Repository, "Newport Branch," Ocean House Stables. S. R. C.
 NEWPORT—Newport Engineering Works, 359 Thames St. Telephone, 150. S. R. C.
 PROVIDENCE—H. G. Martin & Co., 196-200 W. Exchange St. Telephone, 2345 Union. S. R. C.
 PROVIDENCE—Amer. Cycle Mfg. Co., 15 Snow St. Telephone, 51. S. R. C.
 WESTERLY—Albert B. Smith, Cogswell St. Telephone, 37-2. S. R. C.

SO. CAROLINA

COLUMBIA—J. E. Richard, 1526 Pickens St. Telephone, So. Bell No. 55. S. R. C.

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 BRATTLEBORO—Waverly Bros. S. R.

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SEATTLE—Wm. O. Nelson, 1024 Second Ave. Telephone, Main 1030. S. R.

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WASHINGTON—Auto. Storage & Repair Co., Stanton Court. Tel. Main 1146. S. R. C.

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MILWAUKEE—C. G. Norton, 436 Jefferson St. Telephone, 1129. S. R.

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When the SOLAR Shows the Way

If you knew for sure the car would sell better fitted with Solar lamps, you wouldn't bother much with second-bests, would you?

Specially when the best second-best is a weak imitation of the Solar—and costs about the same?

Some pretty clever men among your rivals have found out it's easier to sell a Solar-fitted car than otherwise.

Easier—and Safer.

No after-kick—"The Solar Shows the Way," and the buyer finds it out—and says so to other folks.

Might be as well to hear more Solar-talk, mightn't it?

And to look at photos of the 1905 line?

Whenever you're ready, Mr. Auto Manufacturer.

The Jobber who doesn't get the SOLAR proposition (confidential) is going to miss a lot of auto-lamp sales next season.

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Orient Buckboard, \$375
(Note reduced price)

FAST SELLERS

The Orient 1905 Buckboard Line

Ready for Immediate Delivery



Buckboard Runabout, \$475

Here are four light, fast, simple, practical, reliable motor cars at prices that put them within the reach of pretty nearly everybody.

The Orient Buckboard is not an experiment—it is an established success. The only difficulty we have is to build the machines fast enough.

Anybody can run the Buckboard.

It's as simple as a bicycle and speedy enough to run away from half the touring cars on the road.

These cars are sellers. There is an enormous demand for them, and no other car meets that demand.

Full details and an illustrated catalogue showing the entire ORIENT line of eight cars, if you say the word.

Waltham Manufacturing Company

Members of Association of Licensed Automobile Manufacturers



Buckboard Surrey, \$450

GENERAL SALES OFFICES
(including Western Massachusetts
and Connecticut)

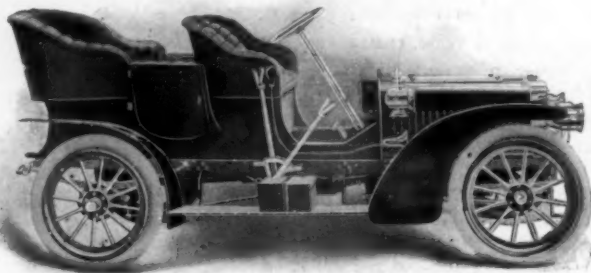
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New York City**

FACTORY and NEW ENGLAND
SALES OFFICE
Waltham, Mass.



Buckboard Tonneau, \$525

WAYNE MODEL B



A 4-Cylinder 24-28 H. P. Touring Car for \$2000

Every feature of excellence found in the highest price 4-cylinder cars at about half the cost. Sliding gear transmission, direct drive, 102-inch wheel base, weight only 1600 lbs., side entrance tonneau and fewer moving parts than any 4-cylinder car made.

MODEL C—Double opposed motor, 16 H. P., side entrance tonneau, wheel base 90 inches. Price \$1250.

MODEL A—Same as Model C, except that the tonneau is detachable, enabling this car to take the place of a runabout. Price \$1200.

CHICAGO SHOW—Spaces 107-108

Catalog and full particulars of all cars sent on request.

Our Agency proposition is perhaps the most attractive in America.

WAYNE AUTOMOBILE CO., ^{Dept.} "R" Detroit, Mich.

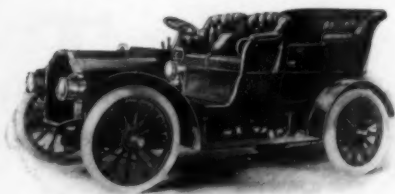
NEW YORK AGENCY—Wayne Auto Agency, 308-310 W. 59th Street

BOSTON AGENCY—Walter C. Masters, 14 and 16 Columbus Avenue

CHICAGO AGENCY—McDuffee Auto Co., 1449 Michigan Avenue

MILWAUKEE AGENCY—The Milwaukee Auto Engine & Supply Co., 706 Winnebago Street

In answering advertisements please mention THE AUTOMOBILE MAGAZINE.



De Luxe, \$2250

HERE is the **ORIENT** 20 H. P., Model de Luxe, Touring Car. It has more points of advantage—real points, that this year's buyers appreciate, and are demanding—more real value for the price—than any other car in America.

1. Four-cylinder, vertical tandem engine.
2. Positive air-cooling system, designed with the experience gained in building more than 3000 air-cooled motors.
3. Direct drive.
4. Sliding gear transmission.
5. Perfect compression (by a new wrinkle in motor building).
6. Large cylinders, with conservative H. P. ratings.
7. Mercedes type hood.
8. The massive, powerful, sweeping lines, beautiful finish and colorings, and the rich upholstery of the swellest imported cars.
9. A price lower by many hundreds than that of any car of equal grade.

One thing is certain—the owner of an **ORIENT TOURING CAR** need never be ashamed of his car in any company. The speed is there, and ease and certainty of operation, and the design is the richest in effect of any American car.



Model F, \$1650

THIS is the **ORIENT** 16 H. P., Model F, Light Touring Car, with Tonneau. It is the **only** car of 16 horsepower (or less) that has all the points of advantage possessed by the massive, powerful French cars. No chain drive—no planetary transmission—no cheaply built, tipping front seat, nor "back door" entrance.

It Stands Alone

in having every engineering feature of the larger cars—the four-cylinder, vertical tandem engine, positive air-cooling, direct drive, sliding gear transmission, and three forward speeds and reverse. The entrance to the tonneau is at the side—a swinging front seat that turns on a metal track (Darracq type)—a fine feature of a fine car—not found in others of this class. We designed the best we knew how last year, and this year we have the same tried and tested engine, with the improvements added by a year of study and experiment.

1905 ORIENTS

EIGHT CARS

TOURING CARS

Touring Runabout, Model E, 16 H. P.,	\$1500
Light Touring Car with Tonneau, Model F, 16 H. P.,	1650
Touring Car, Model G, 20 H. P.,	2000
Touring Car, Model de Luxe, 20 H. P.,	2250

BUCKBOARDS

Buckboard, Model A, 4 H. P.,	\$375
Surrey, Model B, 4 H. P.,	450
Runabout, Model C, 4 H. P.,	475
Tonneau, Model D, 4 H. P.,	525

WRITE FOR OUR ILLUSTRATED CATALOGUE—IT WILL BE SENT FREE

Waltham Manufacturing Company

Members of Association of Licensed Automobile Manufacturers

General Sales Offices

(including Western Massachusetts and Connecticut)

44 BROAD STREET, NEW YORK CITY

Factory and New England Sales Offices

WALTHAM, MASS.

ASK
and
FIND
OUT

NO MATTER what you want to know about an automobile, its power, maker, price, stability, suitability, or anything else, can be quickly ascertained at no additional expense other than for the postage employed in stating your difficulties

TO THE

**Information
Bureau**

OF

The Automobile Magazine

136 LIBERTY ST., NEW YORK CITY

WE DO not claim to know it all, but what we don't know we can find out for you—perhaps better than you can for yourself.

If you are having more than your share of motor troubles we can probably help you. Don't be bashful—send in your queries.

Touring Department

THE AUTOMOBILE MAGAZINE has a Touring Department in charge of an expert who goes personally over the routes he advises you to take. No matter what you want to learn about Routes, Roads, Equipment, etc., you can be sure of getting it right when you address an inquiry to the

Touring Department of The Automobile Magazine

NUMBER 136 LIBERTY ST., NEW YORK

THE following ROUTES have appeared and can be had by sending TWENTY-FIVE CENTS for the issues of the magazine containing them.

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LOWER HUDSON-NEW HAVEN
NEW HAVEN-SPRINGFIELD
PROVIDENCE-NEW HAVEN-NEW LONDON
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NEW YORK-PHILADELPHIA
PHILADELPHIA-WASHINGTON
NEW JERSEY COAST RESORTS-SARATOGA
NIAGARA FALLS-BOSTON-ALBANY
WALLKILL-RONDOUT

You Can't Keep a Good Man Down

The New York Show Proved That. With the
Poorest Possible Space, we made the
Best Possible Showing

Why ?

Real — inbred — rooted-in-the-vein MERIT — that's Why
28 H. P., 4 Speeds, Complete, \$2750

Acme Motor Car Company

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for Ignition purposes get a
mileage certainty obtainable
in no other way. A Knox car
equipped with a **DURO**
has been run over 1,500 miles
without recharging.

ASK FOR PAMPHLET



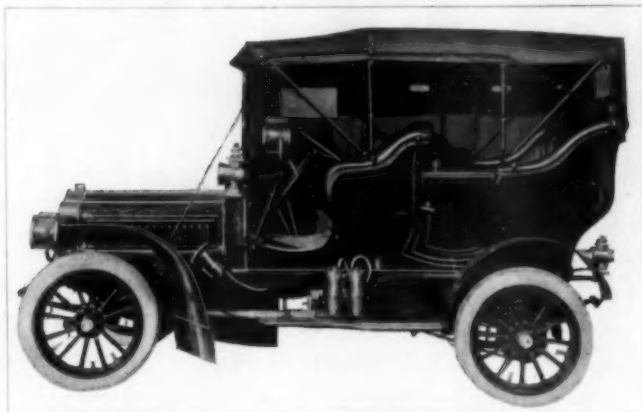
CHICAGO BATTERY COMPANY
1421 MICHIGAN AVENUE CHICAGO, ILL.

In answering advertisements please mention THE AUTOMOBILE MAGAZINE.

The Wonder of the New York Show

Col. Sprague's Canopies

EXCELLENT—MODERN—NOVEL



One of Col. Sprague's Cape Extension Tops with Glass Front



One of Col. Sprague's Cape Extension Tops closed down, leaving the glass front as a wind-break. The "Thomas Flyer" and many others will be equipped with these tops

See Our Novel Exhibit at the Chicago and Cleveland Shows

THE SPRAGUE UMBRELLA CO.

Ask for ☞
Catalogue and Prices

NORWALK, ☞ OHIO

"STEVENS=DURYEA" New 20 Horse-power 4 Cylinder



Touring Car Model R

Great strength, high power, light weight. Eminently suitable to the requirements of the tourist. Send for detailed descriptive matter, illustrating Models L and R.

Price, \$2500.00

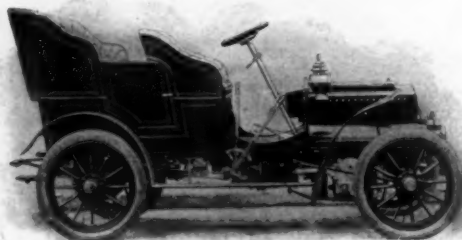
ASK YOUR AUTO AGENT

J. STEVENS ARMS & TOOL COMPANY

710 Main Street

Chicopee Falls, Mass., U. S. A.

Members Association
Licensed Automobile
Manufacturers :: ::



MODEL "D"

1905 CHAINLESS WOLVERINE

Every part accessible; speed: plenty of it; safe; a hill climber; 2 models, "C" and "D;" Model "C," Rear Entrance Tonneau.

THE REID MANUFACTURING CO.

New Catalogue, Department "G"

DETROIT



Continental TIRES



Be Very Careful

when ordering your automobile that it embodies all the latest improvements. Above all, be sure to specify the famous imported

Continental Tires

You will then have the most durable and resilient tires on the market. The leading foreign cars are equipped with them. Every American manufacturer will furnish them when so specified.

Send for specification blank and copy of "OPINIONS"

DEPARTMENT A. M.

**CONTINENTAL CAOUTCHOUC COMPANY,
298 BROADWAY, NEW YORK.**

Factory—Hanover, Germany

EMIL GROSSMAN, Gen. Mgr.

Notice to the Trade

WE HAVE entered suit against the United States agency of the MICHELIN TIRE CO. for infringement of G & J patents, and the trade is warned against the purchase of such tires. The following manufacturers are licensed under G & J patents:

Hartford Rubber Works Co.	Continental Caoutchouc Co.
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Morgan & Wright	India Rubber Co.
Fisk Rubber Co.	

G & J TIRE CO.

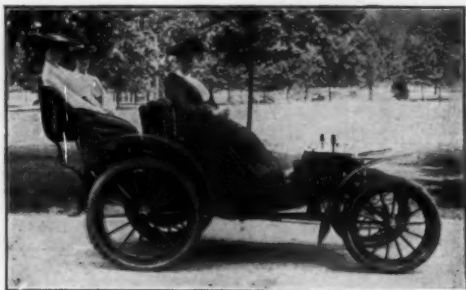
MAIN OFFICE and FACTORY, INDIANAPOLIS, IND.



The DURYEA



The **DURYEA** is a leader. This was again proven on Eagle Rock, Thanksgiving day. A **DURYEA** entered by an owner, not by an agent or ourselves, beat all stock gasoline vehicles under \$3500 in price excepting one of 22 H. P. Although having less than 55 per cent. of the power, it made within 10 per cent. of the time of the winner and beat vehicles of 40 H. P. and \$4000 in price. **DURYEA**s lead in efficiency. Why pay for power, gasoline, weight and tires when a **DURYEA** at a medium price and low maintenance cost gives best results?



[ONE HAND DOES IT ALL.

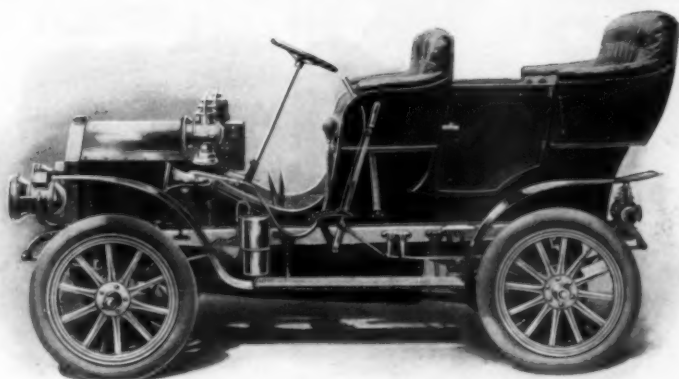


DURYEA POWER CO.

C STREET - READING, PA.



Columbia 18 H.P. Mark XLIV SIDE DOOR TONNEAU



DDOUBLE opposed horizontal engine under forward bonnet. Cylinders automatically lubricated. Single lever speed change. Sliding gears in oil bath. Direct transmission. Standard spark plugs. Foot operated clutch, throttle and brake. Hand emergency brake. Pressed steel frame. Long wheel base. Easy springs. Luxurious side entrance body with individual front seats and full width cross seat at rear. A powerful, fast, enduring car, equal in capacity and performance to many four-cylinder cars, and only half as complicated. Equipment includes full complement of lamps, tools, horn, etc. Weight, 1800 pounds.

Price \$1750

Winner of three events for cars costing from \$1001 to \$1800,
at Ormond, Fla., January 24, 1905.

Catalogue of Columbia 35-40 and 18 horse-power. Gasoline cars will be sent on request. Also special Catalogues of Columbia Electric Carriages and Columbia Electric Commercial Vehicles.

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134-138 West 39th Street

CHICAGO:

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Member Association Licensed Auto. Mfrs.

1905 Will be the
"Mechanically
Fastened Year"

WHY ?



The Success of that Tire

The manner in which it has solved the tire problem and reduced the troubles and the cost of tire maintenance simply has compelled acknowledgment.

Success Always Begets Imitation

The FISK was first; it is still in front. It is the only mechanically fastened tire that actually has stood the test of time. It has left off where the others are but just beginning.

The Fisk Rubber Company

CHICOPEE FALLS, MASS.

BRANCHES:—New York, Buffalo, Syracuse, Philadelphia, Boston, Chicago, St. Louis, Minneapolis, Omaha, Detroit, Denver, San Francisco.

American Motor League

IMPORTANT

The American Motor League will hold a meeting of its members at Chicago this month. This meeting occurs during the week of the Chicago Automobile Show. Reduced railroad rates have been granted to A. M. L. members attending this meeting, and these reduced rates will be granted only to members of the A. M. L. Full printed information will be sent on request.

The American Motor League is now collecting and compiling route information from all parts of the country, and will print Road Books for ten important States as soon as this information is completed. The League also proposes to establish a Route Information Bureau, from which information will be sent out to all inquiring automobilists by an expert employed for that purpose. The A. M. L. is the only organization which permits individual members (not members of clubs) to be represented by delegates at League meetings.

Recognized Automobile Clubs are received into the League on payment of a nominal fee only.

There is no initiation fee. The annual dues paid by each member is two dollars.

Full printed information relating to the League, and its object, will be sent on receipt of postal-card request.

American Motor League

Vanderbilt Building

New York City

THE CAR ILLUSTRATED

Edited by the Hon. JOHN SCOTT MONTAGU, M.P.

Price, 15c.

**A Weekly Newspaper of Automobile Events
and Travel Superbly Illustrated on Art Paper**

**Awarded FIRST PRIZE for Illustrated Automobile
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Annual Subscription Rate, Post Free:—\$9.00. Shorter periods pro rata.

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17 Shaftesbury Avenue, London, England

Also obtainable at the International News Co., Duane St., N. Y.

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Edited by the Hon. JOHN SCOTT MONTAGU, M.P.

Monthly. Price, 15c.

The Glasgow Herald says:—"From the pictorial point of view it leaves nothing to be desired, but one can be even more eulogistic in reference to its literary contents, which have ranged throughout the world in search of material, and given it an emphatic right to its sub-title—'A Monthly Review of Travel.'"

Over 100 Illustrations on Art Paper

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Part II Now Ready. Price, 90c.

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Albion
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**An Invaluable Guide for Intending Motorists
and those desirous of Driving their Own Cars**

Profusely Illustrated on Art Paper

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By Royal
Warrant
to His
Majesty
The King



Over
50 Gold
and Prize
Medals
Awarded



Dewar's Scotch Whisky

"SPECIAL" and "WHITE LABEL"

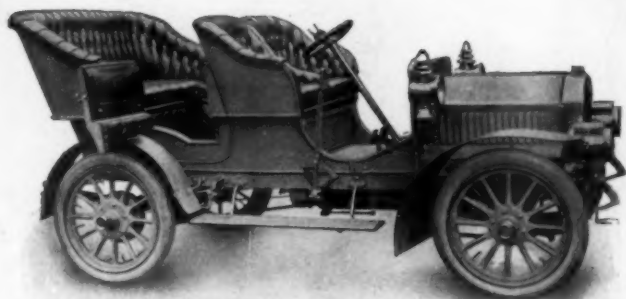
(The Fine Old Highland)

(The Whisky of Great Age)

JOHN DEWAR & SONS, Limited

United States Branch: Knickerbocker Trust Building, Fifth Avenue
and 34th Street, opposite Waldorf-Astoria, New York

FREDERICK GLASSUP, SOLE AGENT



Pope-Hartford, Model D
16 H. P. Price \$1600

Pope-Hartford

Model D, our new 2-cylinder touring car for 1905, is thoroughly up to date in design, workmanship, finish and equipment. It has a divided front seat with two comfortable side entrances, carries five people, two in front and three in the tonneau. The engine is of the 2-cylinder horizontal opposed high compression type, developing 16 H. P., and the transmission is sliding gear with three speeds forward and one reverse. It is driven by a shaft and bevel gears and the machinery is the best that skill and experience can produce, every detail having been carefully studied for efficiency in the engine and mechanical parts and for comfort in arrangement and equipment. The car is beautifully designed and gives the maximum strength with minimum weight.

Model B, 10 H. P.

Price \$1600

Price \$1000

Pope-Tribune

Model 4 is our light 1905 touring car at a moderate cost, and in design follows the lines of the best American and Foreign cars. The engine is of the 2-cylinder high compression type and will develop 12 H. P. The transmission is of the individual clutch type, with three speeds forward and one reverse, and the car is driven by a shaft and bevel gears. The front seat is divided and the tonneau is of the modern side entrance style. The car will seat four people comfortably, two in front and two in the tonneau.

Model 2, Runabout, 6 H. P.

Price \$900

Price \$500

POPE MANUFACTURING CO., Hartford, Conn.

Members Association Licensed Automobile Manufacturers



1905 THOMAS
40 HORSE "FLYER"
\$3000

**A Big, Powerful,
 Touring Car that
 Laughs at Hills and Mud**

**Catalogue and Book
 of Testimonials upon
 request.**

E. R. THOMAS MOTOR CO.
 1298 Niagara Street, Buffalo, N. Y., U. S. A.
 Members of Association of Licensed Automobile Manufacturers. See our Exhibits at New York and Chicago Shows.

FOR EFFICIENCY WE CHALLENGE ALL OTHERS
 DOMESTIC AND FOREIGN

AT THE AUTOMOBILE SHOWS, NOTICE

"Whitney" Chains

ON MOST OF THE LEADING CARS

**RIVETED
TYPE**



**COTTER
DETACHABLE
TYPE**

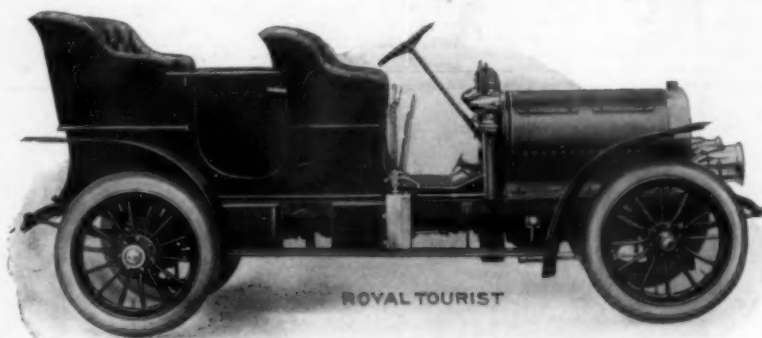


The WHITNEY MFG. CO., HARTFORD
 CONN.

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The **Royal Tourist**

==“TRUE BLUE”==



32 - 38 H. P. :: GUARANTEED :: 2500 Pounds

\$3000.00

No Better Car at any Price

Automatic lubrication of motor and transmission

Direct shaft drive — Free driving axle

Detachable clutch — No adjustment

Controls on top of steering wheel

Positive throttle — No mechanical governor

4½ tires — Full lamp equipment

Advanced design of body — Hood — Dash

The Royal Motor Car Company

CLEVELAND, OHIO

Dept. 7

NEW ENGLAND AUTOMOBILE CO.

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HARRY BRANSTETTER CO.

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C. A. DUERR & CO., Inc.

Broadway and Fifty-eighth Street

New York, N. Y.



SYNNESTVEDT MACHINE COMPANY

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Manufacturers of

Electric Vehicles

DELIVERY WAGONS
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STANHOPE'S
BUSSES

TRUCKS

The
Acme of
Mechanical
Excellence

PREMIER

Agents
in all
Important
Cities



One of the
Most
Popular Cars
at the Shows

(The air cooled has no season)

Premier Motor Mfg. Co.
INDIANAPOLIS, IND.

Write for
Descriptive
Catalogue
of the
Quality Car

DON'T FAIL TO VISIT THE
NATIONAL MOTOR BOAT AND SPORTSMAN'S SHOW
Madison Square Garden
NEW YORK CITY
FEBRUARY 21st TO MARCH 9th, 1905

Thread

G & J TIRES

Fabric

Most
Durable
Fastest
Safest

The thread fabric construction removes all internal friction from the fabric, so that the tires do not heat up under the longest drives at the highest speed. That is why G & J thread fabric tires are the most serviceable automobile tires in the world.

G & J TIRE CO.

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INDIANAPOLIS, IND.

Branches
Chicago, Ill. Detroit, Mich.



Rims branded in the channel with these copyrighted marks have been inspected and pronounced perfect. We guarantee our tires on all rims so branded



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Non-Fluid Oils

Lubricate Without Dripping and Wasting Like Fluid Oils. Unlike Greases, Do Not Gum Up Bearings and Decrease Mechanical Efficiency of the Engine.

Will reduce your lubricating expense largely; insure most efficient service from your car; and keep repair bills down to a minimum.

Ask Your Dealer or Send to Us for Free Sample.

N. F. O. Auto Lubricant Gun



1905 Model

Fills a long-felt want, for conveniently and economically applying lubricants in the transmission or other hard-to-reach parts. Can be operated with one hand, which saves crawling under the car.

Will soon return its cost in oil saved, and last a lifetime.

Ask Your Dealer or Write Us for Circular.

NEW YORK AND NEW JERSEY LUBRICANT COMPANY, 14 and 16 Church St., NEW YORK
79 Ninth St., SAN FRANCISCO

[See Us at the New York Show, Block "U," Main Floor, Elevated Platform]



To Owners of Gas and Gasoline Engines, Launches, Automobiles, Etc.

Do away entirely with ALL starting and running batteries and their constant trouble and expense by using instead an

Auto-Sparker.

No belt—no switch—no batteries. Can be attached to any engine now using batteries. Fully guaranteed and costs less than 50 cents per year to operate. Write for descriptive booklet and testimonials.

MOTSINGER DEVICE MFG. CO.
38 Main Street, Pendleton, Ind.

Garage to Let.

For Lease or Sale.—All iron building, 50x200; good light; 17 foot ceiling; solid floors; entrances through both ends and side; 12 horse-power gas engine; shafting and wood-working machinery in operation. Half block from North River; three blocks from New York Central freight house. Will sell building and plant with eighteen years cheap ground lease. A genuine bargain. Vacant property adjoining to lease. HAGEN, 627 West 57th Street, Manhattan.

The 1905 Serpollet

the simplest, safest and best steam automobile in the world. A gentleman now abroad will give full details about it, and attend to American orders. Address "SERPOLLET", 34 West 26th Street, New York.

FISCHER ESTD 1840. NEW SMALL GRAND

A Small Piano of Large Power and Wonderful Sweetness and Purity of Tone Quality

Its case architecture possesses a charm to please the most fastidious.

Its durability of construction is pronounced and thorough.

It occupies a trifle more space than the Upright.

It must be seen and heard to be appreciated.

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J. & C. FISCHER

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DO YOU EVER MOTOR FOR PLEASURE?

In such case you should read each month's issue of

THE MOST BEAUTIFUL MAGAZINE PUBLISHED

COUNTRY LIFE IN AMERICA

Single numbers, 25 cents; Double numbers, 50 cents; \$3.00 a year

It contains a practical automobile article of value to every tourist. Moreover, it has to do with every phase of outdoor sport and life in the country and is wonderfully illustrated from photographs.

DOUBLEDAY, PAGE & COMPANY, NEW YORK

The Automobile Magazine

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Published Monthly by

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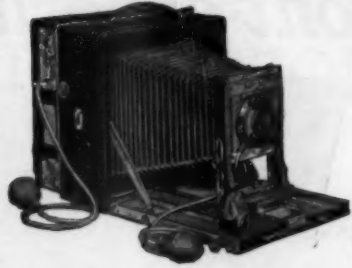
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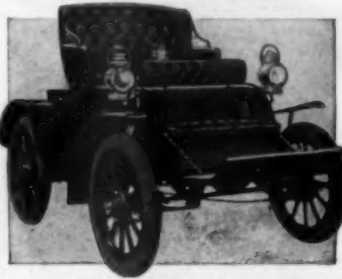
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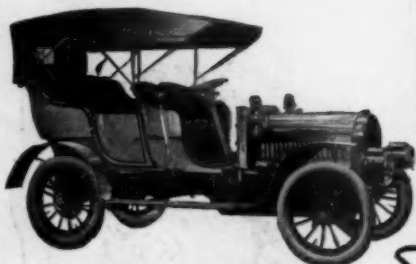
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American Motor League

IMPORTANT

The American Motor League is now collecting and compiling route information from all parts of the country, and will print Road Books for ten important States as soon as this information is completed. The League also proposes to establish a Route Information Bureau, from which information will be sent out to all inquiring automobilists by an expert employed for that purpose. The A. M. L. is the only organization which permits individual members (not members of clubs) to be represented by delegates at League meetings.

Recognized Automobile Clubs are received into the League on payment of a nominal fee only.

There is no initiation fee. The annual dues paid by each member is two dollars.

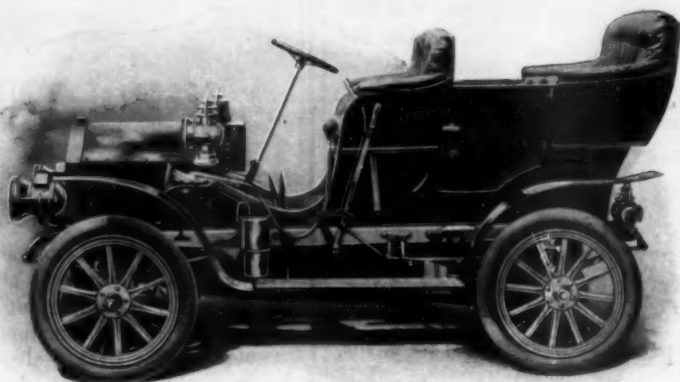
Full printed information relating to the League, and its object, will be sent on receipt of postal-card request.

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Vanderbilt Building

New York City

Columbia 18 H.P. Mark XLIV SIDE DOOR TONNEAU



DDOUBLE opposed horizontal engine under forward bonnet. Cylinders automatically lubricated. Single lever speed change. Sliding gears in oil bath. Direct transmission. Standard spark plugs. Foot operated clutch, throttle and brake. Hand emergency brake. Pressed steel frame. Long wheel base. Easy springs. Luxurious side entrance body with individual front seats and full width cross seat at rear. A powerful, fast, enduring car, equal in capacity and performance to many four-cylinder cars, and only half as complicated. Equipment includes full complement of lamps, tools, horn, etc. Weight, 1800 pounds.

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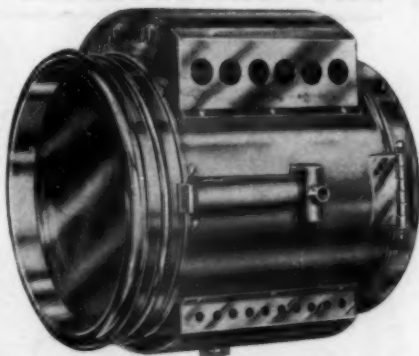
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Model C, Runabout, 4 H. P.	475
Model D, Tonneau, 4 H. P.	525

Waltham Manufacturing Company

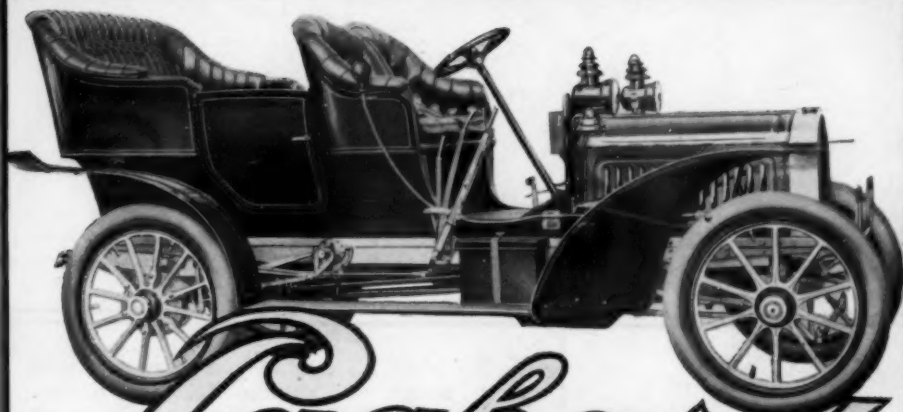
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Bureau**

OF

The Automobile Magazine

136 LIBERTY ST., NEW YORK CITY

WE DO not claim to know it all, but what we don't know we can find out for you—perhaps better than you can for yourself.

If you are having more than your share of motor troubles we can probably help you. Don't be bashful—send in your queries.

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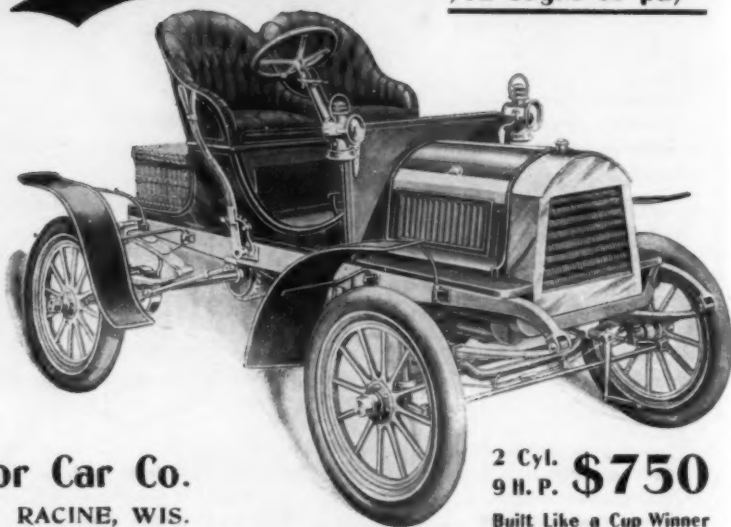
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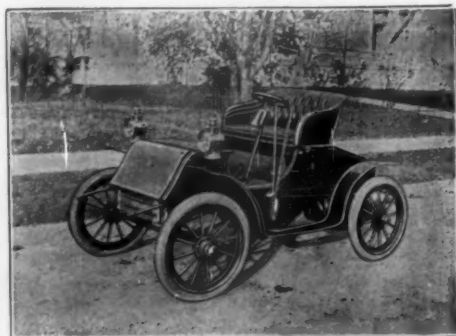
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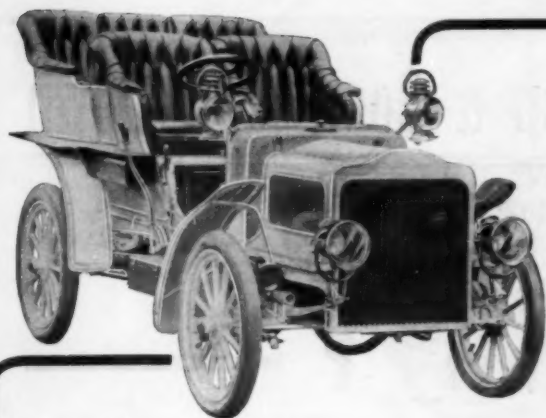
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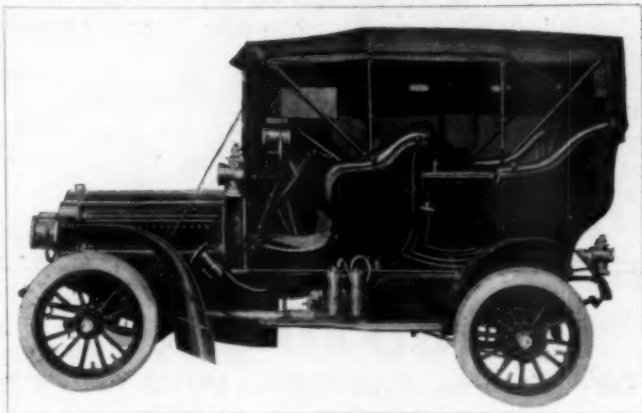
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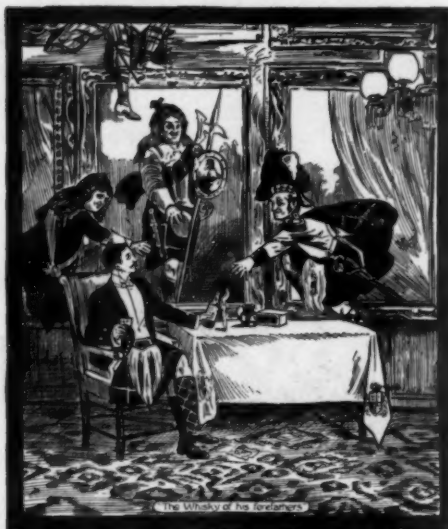
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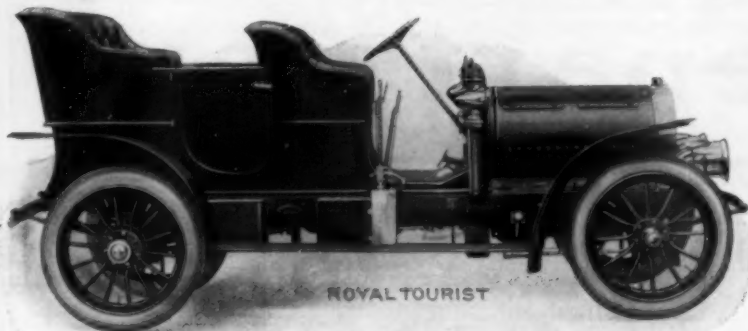
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NUMBER 136 LIBERTY ST., NEW YORK

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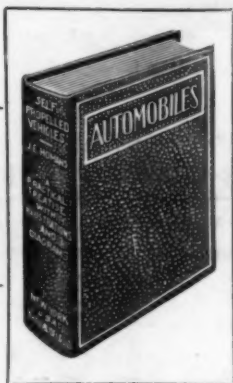
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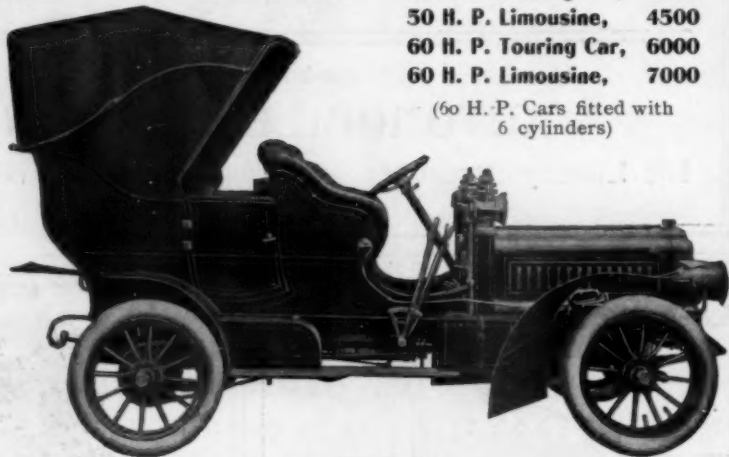
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Victoria Top

\$3500

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Large Factories
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Day and Night
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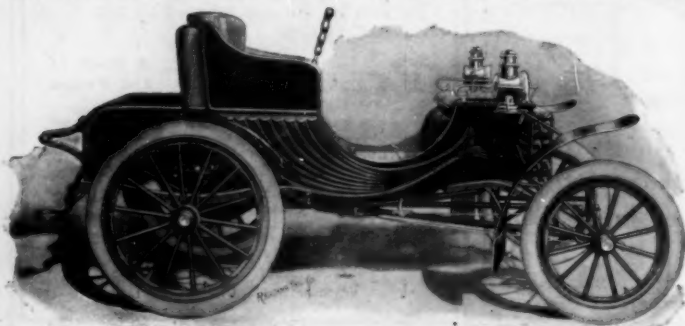
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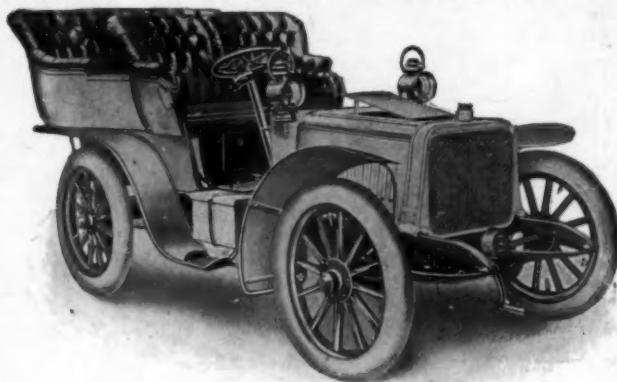
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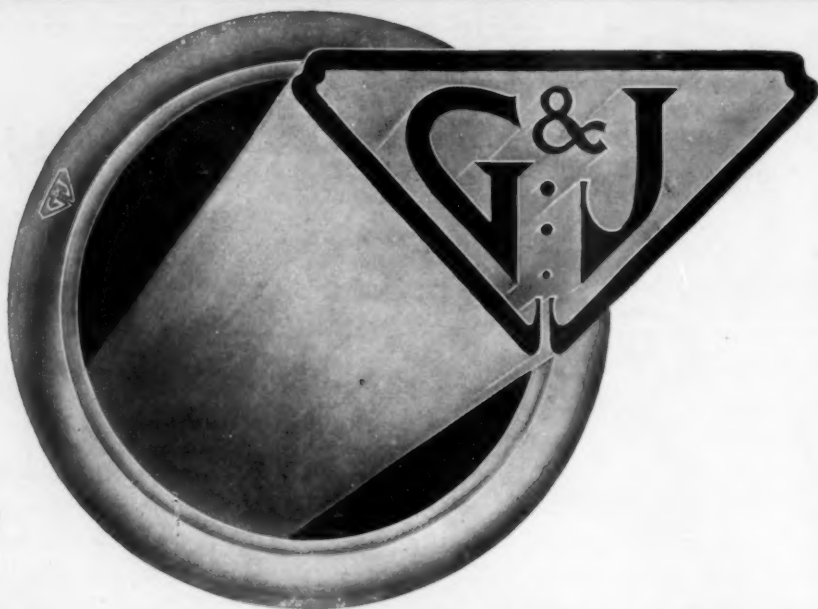
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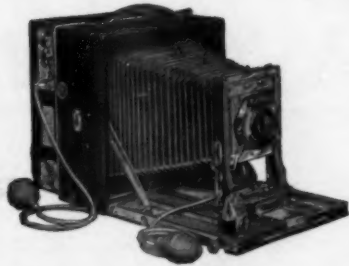
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Model G, Touring Car, 20 H. P.	2000
Model de Luxe, Touring Car, 20 H. P.	2250

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Buckboard, Model A, 4 H. P.	\$375
Surrey, Model B, 4 H. P.	450
Runabout, Model C, 4 H. P.	475
Tonneau, Model D, 4 H. P.	525

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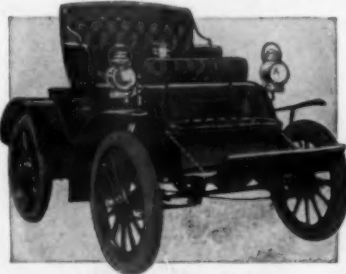
ASBURY PARK—C. R. Zacharias, 725 Mattison Ave. Telephone, 40F. S. R. C.
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PIERCE



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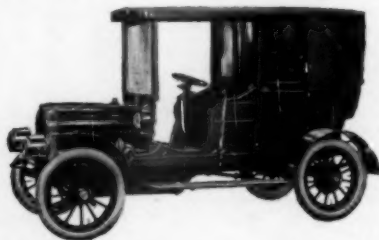
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Recognized Automobile Clubs are received into the League on payment of a nominal fee only.

There is no initiation fee. The annual dues paid by each member is two dollars.

Full printed information relating to the League, and its object, will be sent on receipt of postal-card request.

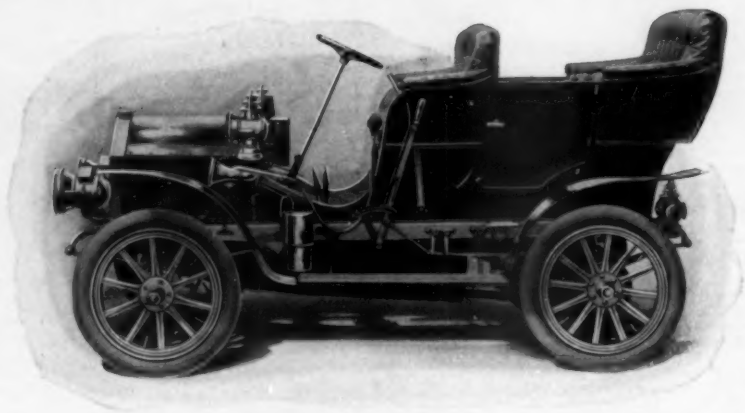
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WASHINGTON

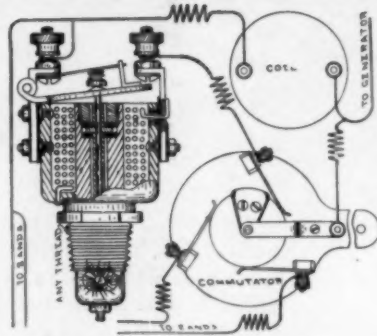
SEATTLE—Wm. O. Nelson, 1024 Second Ave. Telephone, Main 1080. S. R.

WASHINGTON, D. C.

WASHINGTON—Auto. Storage & Repair Co., Stanton Court. Tel. Main 1146. S. R. C.

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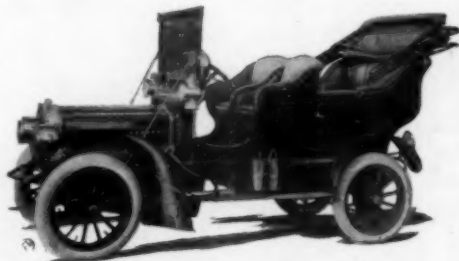
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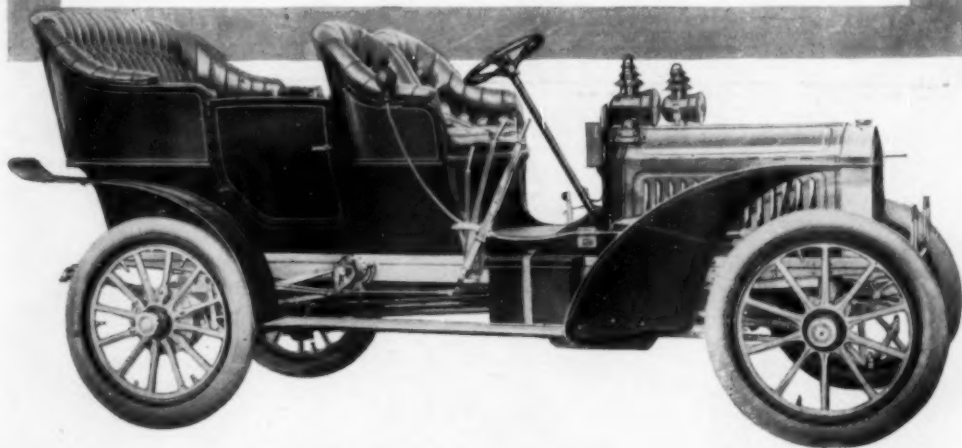
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Price, with standard Equipment, **\$3500, f. o. b. Detroit**
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NO MATTER what you want to know about an automobile, its power, maker, price, stability, suitability, or anything else, can be quickly ascertained at no additional expense other than for the postage employed in stating your difficulties

TO THE

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Bureau**

OF

The Automobile Magazine

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If you are having more than your share of motor troubles we can probably help you. Don't be bashful—send in your queries.

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Worthington Automobile Co.....	Front Cover

The BIG FOUR of the

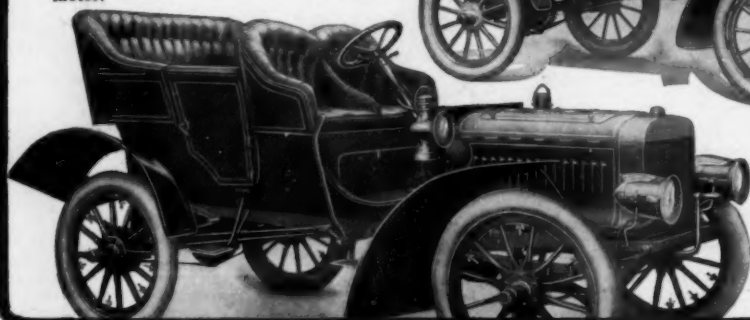


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Removable rear entrance tonneau, double opposed motor.

Model B, \$2,000
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Sole Agent for North America, Central America and West Indies

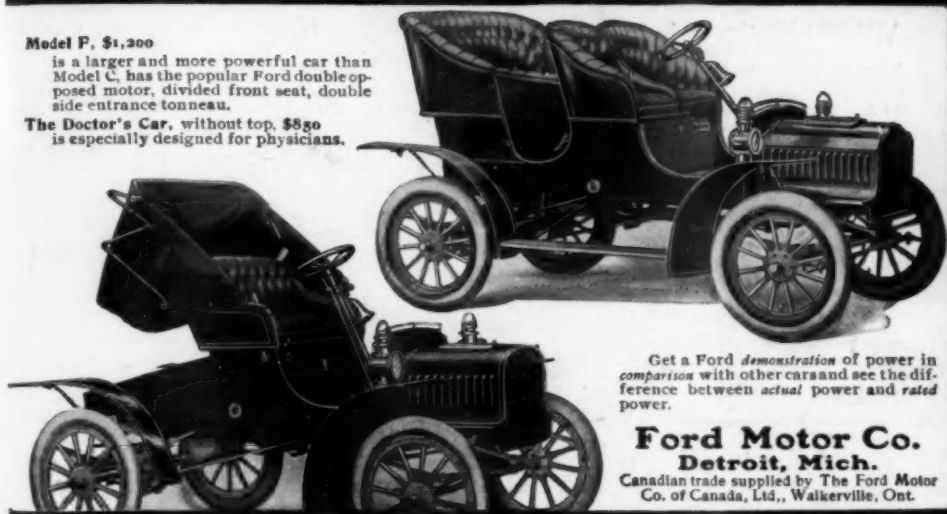
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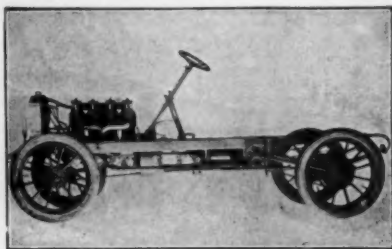
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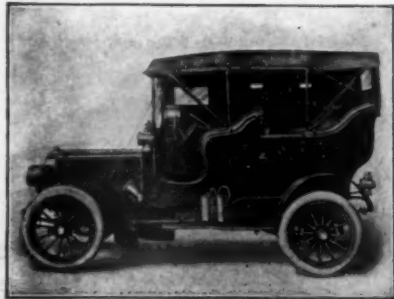
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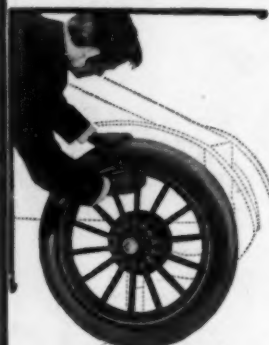
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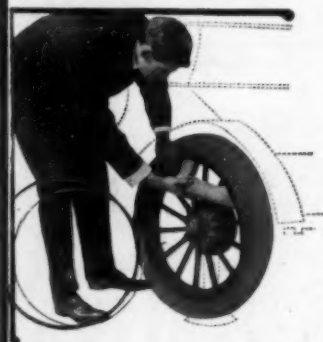
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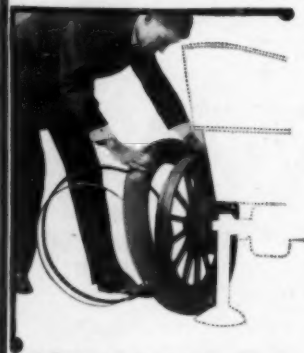
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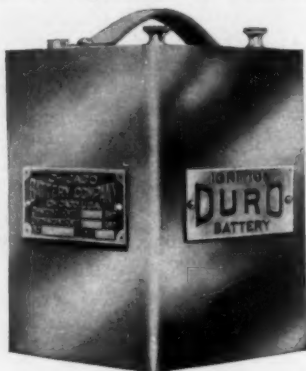
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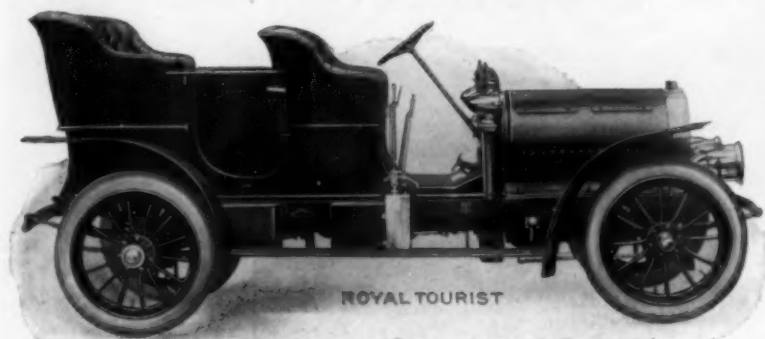
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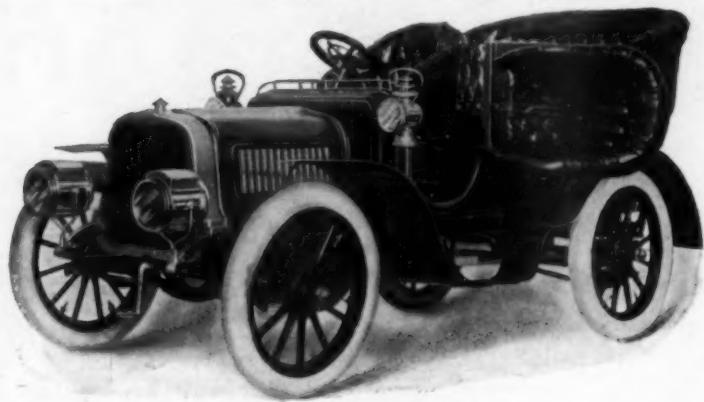
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NUMBER 136 LIBERTY ST., NEW YORK

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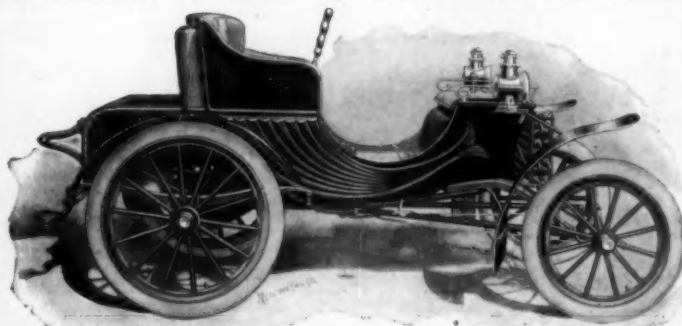
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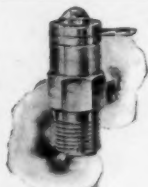


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The Automobile Magazine

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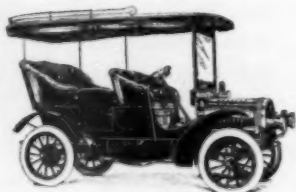
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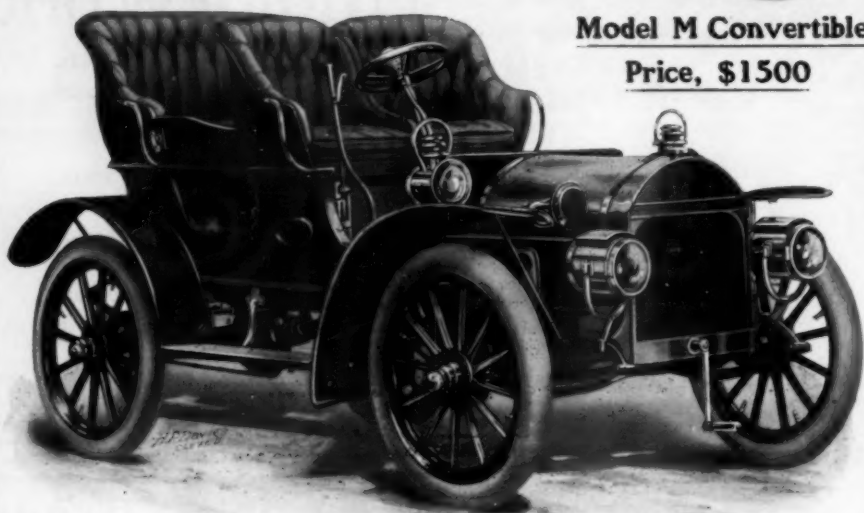
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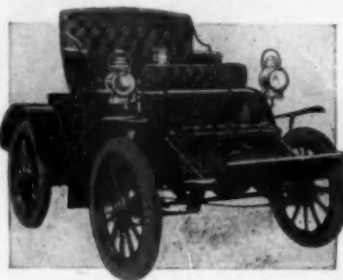
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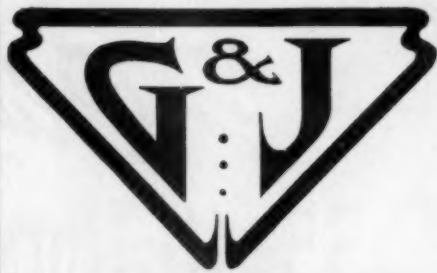
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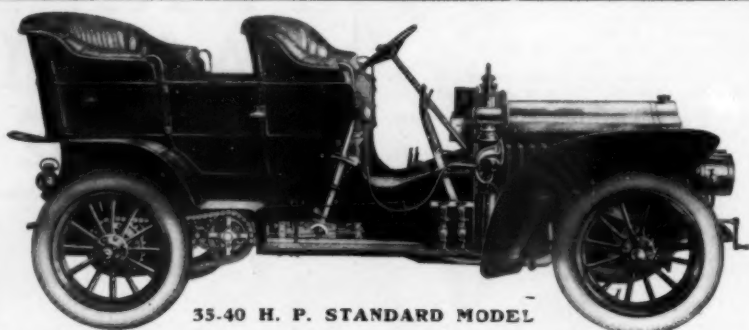


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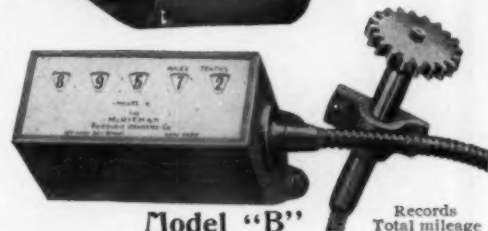
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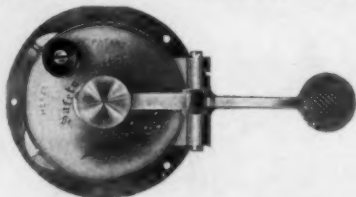
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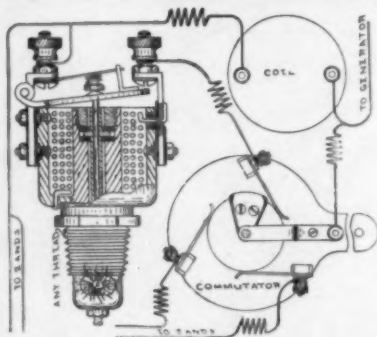
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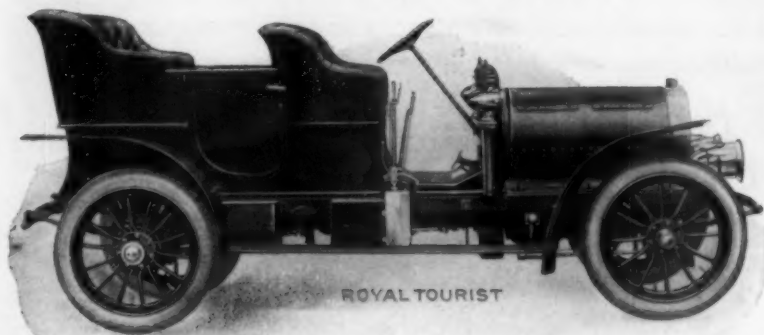
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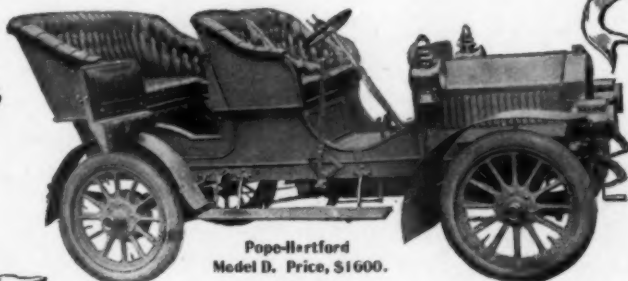
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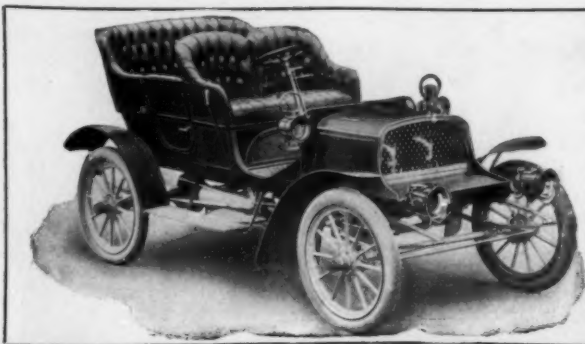
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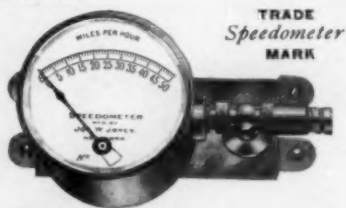
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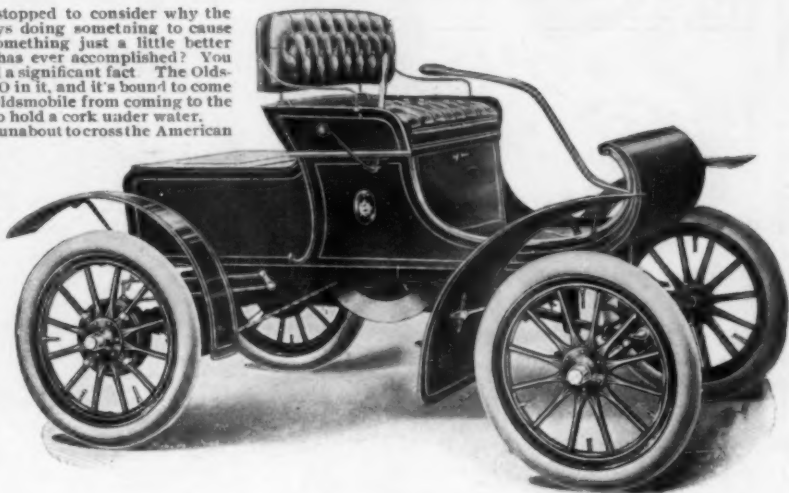
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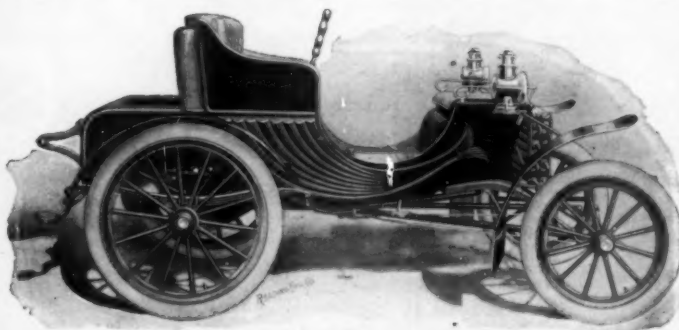
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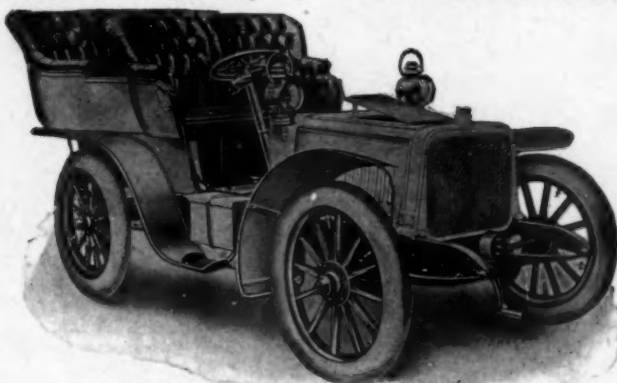
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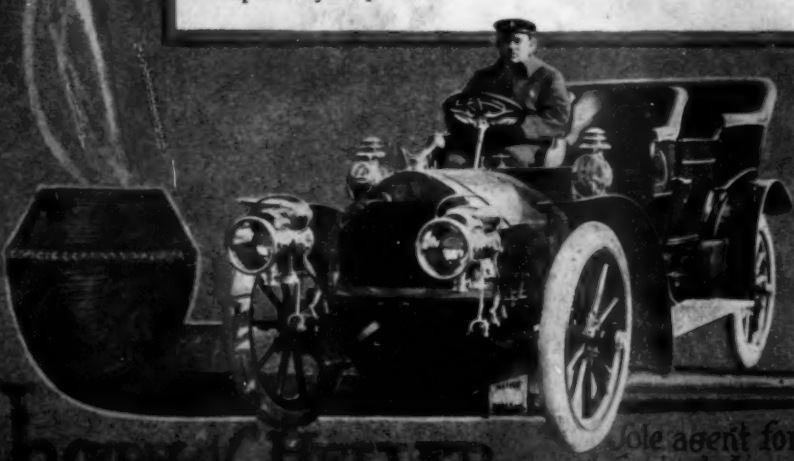
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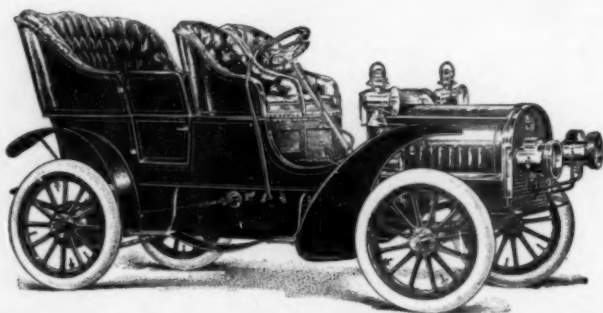
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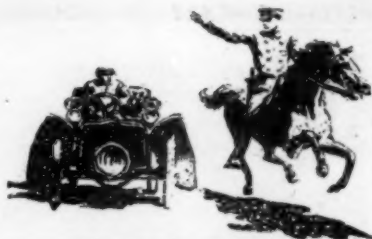
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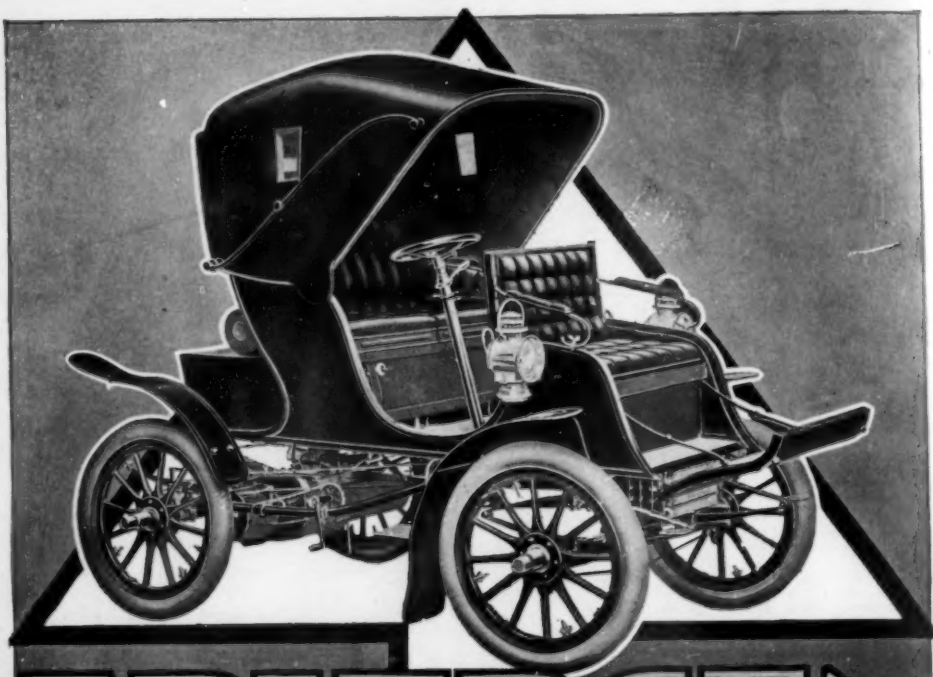
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Recognized Automobile Clubs are received into the League on payment of a nominal fee only.

There is no initiation fee. The annual dues paid by each member is two dollars.

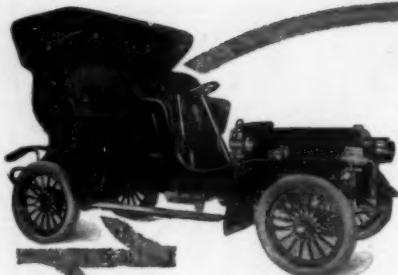
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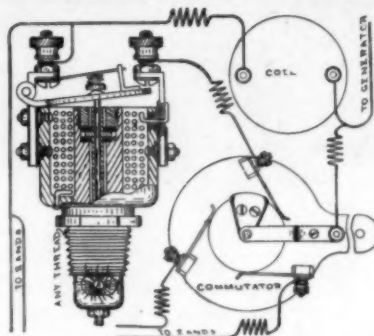
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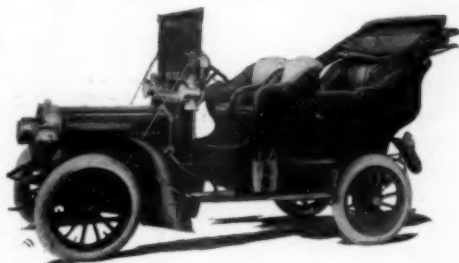
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but facts are what count in the automobile business. Many customers are prone to buy a locomotive because some of their wealthier friends have one, and then kick on account of repair bills. There is a happy medium to be had by owners, and when you avoid the cheap runabouts, don't make the mistake of paying three or four prices for complicated power which you can never use. Unnecessary mechanism is

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The time made by our regular stock 20 H.P. Car was 37 3-8 seconds, which was the best time made BY ANY AMERICAN GASOLINE CAR.

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and
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TO THE

**Information
Bureau**

OF

The Automobile Magazine

136 LIBERTY ST., NEW YORK CITY

WE DO not claim to know it all, but what we don't know we can find out for you—perhaps better than you can for yourself.

If you are having more than your share of motor troubles we can probably help you. Don't be bashful—send in your queries.

and proper sounding of the horn is most vital. Here's where Charles E. Miller comes to the front as usual in his role of the universal want detector and filler. You press the button, electricity and Miller do the rest. The Miller innovation consists of a horn of the ordinary form, having the usual reed, however, replaced by a diaphragm, like that of a telephone receiver. This diaphragm is caused to vibrate by a magnet alternately magnetized and demagnetized by a current of electricity flowing through a coil fitted with a vibrator. Six cells of a dry battery will produce a roar in the horn that should be effective in calling attention to the approach of a car to a dead man. The note produced is peculiar, and differs considerably but indescribably from that of the ordinary reed horns. The apparatus is furnished complete with horn or to be attached to the horn already on the car. The button for operating it may be placed in any desired position, so that either foot or hand may be used for sounding the horn, thus making the giving of an alarm something which does not call for the driver to neglect at the same time some equally important matter connected with the handling, guidance or stopping of the car itself.

Do you know it isn't everything to make a car go. Some people seem to think it is, but they change their opinions at once and for all, the first time the reverse of the go ahead proposition is put up to them and they find they can't fill the bill. If I had my choice between having a car equipped with a faulty brake and an excellent motor, or a faulty motor and an excellent brake, I believe I'd choose the latter. If a car refuses to go it really can't harm anyone; if it refuses to stop it might injure everyone. I thought of all this when recently I came across one of the cleverest things

in the brake line I have ever seen. The whole idea was so simple and so certain of action that it is a mystery to me why it has not always been employed on gasoline cars. The little fitment combines in itself an ingeniously designed and constructed switch with permanent or temporary cut out all actuated by the mere pressing of a foot lever. The motor thus abruptly deprived of its igniting spark acts as a brake at once, but does so gently, without producing any sudden jar. Another advantage of all this is that this switch, fastened to the dashboard, may be used as an electric emergency brake and operated by the foot of the driver or the person sitting beside him, whichever of them may see a danger which has escaped the notice of the other, thereby avoiding many accidents which occur where such a safeguard is lacking. The Hess Ignition Co. have certainly completely filled a long felt want with this device.

"Here's a novelty," said the jeweler into whose place I had strayed looking for an expert repairer for the split second timer I wanted to use up at Morris Park, "that is very popular this season among that class which has more money than it knows how to spend."

He took from a little satin-plush box a miniature automobile, about an inch and a half long, and sent it spinning across the show-case. It struck two or three other articles of jewelry, and, in true scorcher style, bowled them over. The little car was perfection in every detail. The frame, made of platinum, had not a part missing. The hubs of the little wheels (the wheels being not much larger in diameter than a pencil) were diamonds; diamonds ran along the sides of the seats, and the seats themselves were made of several rubies forming a radiant, if somewhat hard, cushion. The lamps were a ruby

and an emerald on either side, and a diamond in the center of the dashboard. On the back of the car was a pin by which to attach the affair to the dress of the foolish woman who might become its owner. The price on the tag was \$7,000. I did not buy it, and among all the fools I know, and believe me I know an awful lot of them, I can't think of one who would be quite enough of an idiot to pay such a price for such an utterly useless and senseless toy.

I heard a good one on R. E. Hardy, the genial gentleman whose business as well as pleasure it is to preach the gospel of excellency as exemplified in the Sta-rite plug. A rather impressive looking individual came into Mr. Hardy's place and finding the proprietor of it disengaged he asked if this was the place where they made a specialty of ignition. Recognizing the unexpected arrival of an angel, Mr. Hardy opened up his information batteries and at once proceeded to fill the visitor chuck full of the science of ignition, especially that brand of it which the Sta-rite plug was supposed to hold down. Once or twice the visitor tried to interrupt, but it was no use. Hardy had got started on a subject he is truly an expert and an enthusiast on, and nothing could stop him. Finally, however, Hardy finished and the visitor had a chance to say, "Oh yes, it is all very interesting, don't you know, but this spark affair isn't the kind of ignition I wanted to inquire about. What I really wanted was to borrow a match" —. But Hardy was in his private office long before the explainer could finish telling about what he expected to ignite with the match he intended to borrow, though a ready filled pipe which he had held unused all during the talk would probably have given Mr. S. Holmes a very good clew as to his intentions.

There was a day, and not so very long ago, either, when the only question an intending purchaser of a car asked was, "How fast will it go?" While it is true that this sort of thing is very far from ceasing to exist even now, yet each day sees the old question of speed being supplanted by the saner one of how far not how fast a car can travel on a given amount of fuel. Ordinarily an arbitrary figure for this is set and the purchaser accepts the statement as true, buys and is contented or discontented, as circumstances subsequently determine, with his bargain, or the reverse. Amid all of this guesswork comes the redoubtable S. F. Edge, who proceeds to give us some valuable data as a basis for determining just how far a well built car should travel on the road while consuming a single gallon of gasoline. In making his tests, Mr. Edge employed a standard four cylinder 20 H. P. Napier car fitted with a special gasoline tank holding exactly one gallon. The start was made from a milestone just outside of London. The first test resulted in 25 $\frac{1}{4}$ miles on one gallon of fuel, this including the climb up Dashwood Hill. The tank was then refilled and the second test, held on a continuation of the same road, showed 24 $\frac{1}{2}$ miles. On the third gallon 24 $\frac{3}{4}$ miles were covered, and the fourth gallon permitted a run of 27 miles flat. These tests showed an average of 25-11/16 miles for each gallon of gasoline consumed by the car, a performance which certainly is closely approaching the phenomenal, since working it out with gasoline at say thirteen cents in this country, a car here doing as well as the British one did would carry its user at an average expense per mile traveled of less than one-half of a cent, a price which certainly cannot be considered exorbitant, not even by a motorphobe.

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Majesty
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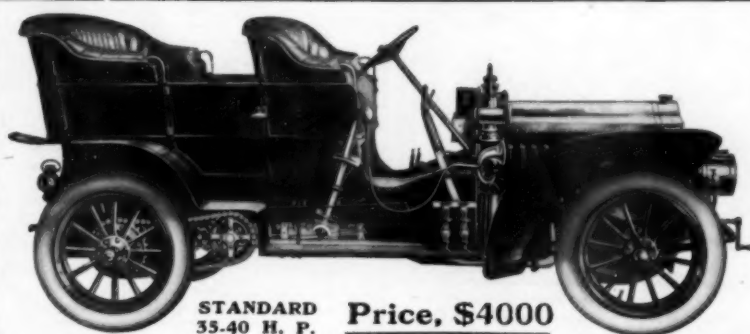
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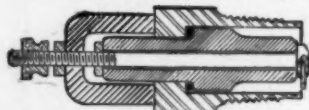
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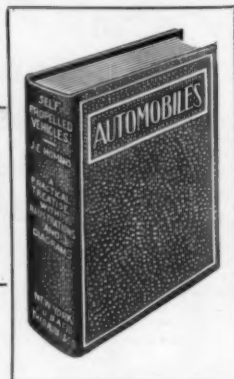


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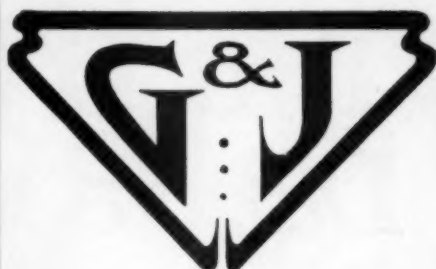
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THE KIND THAT
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Rims branded in the channel with these copyrighted marks have been inspected and pronounced perfect. We guarantee our tires on all rims so branded



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Touring Department of The Automobile Magazine

NUMBER 136 LIBERTY ST., NEW YORK

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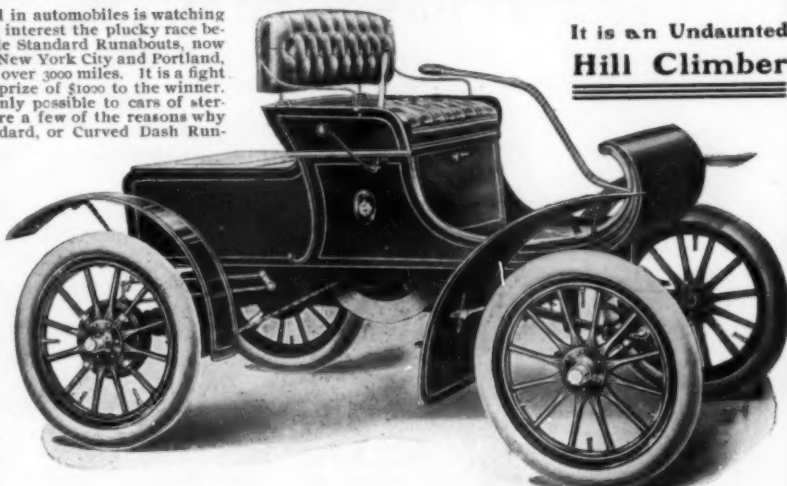


OLDSMOBILE PRICE \$650

Everyone interested in automobiles is watching with daily increasing interest the plucky race between two Oldsmobile Standard Runabouts, now in progress between New York City and Portland, Oregon, a distance of over 3000 miles. It is a fight to the finish, with a prize of \$1000 to the winner.

Such a contest is only possible to cars of sterling quality. Here are a few of the reasons why the Oldsmobile Standard, or Curved Dash Runabout, is the car naturally selected for all contests where strength, endurance and thorough dependability are essential. It has a single cylinder horizontal motor of 7 h. p., the vibration of which is reduced to a minimum by proper balance. Noise of exhaust almost eliminated.

The carbureter is of the automatic float feed type. It develops the highest horse-power at all speeds, and enables the motor to be readily started.



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XXV

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**For New England
1905**

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TRENTON, N. J., May 5, 1905.

MR. S. F. HEATH,

c/o E. R. Thomas Motor Co., Buffalo, N. Y.

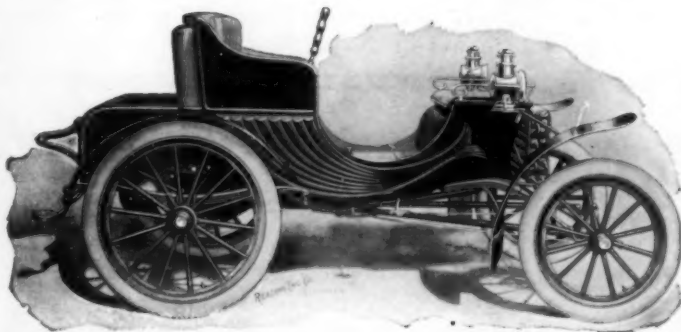
My Dear Mr. Heath:

Yesterday I took a twenty-five mile run in my brother's car, and I don't know that I ever rode in a smoother running machine. I can't tell you how much pleasure it gave me, for I felt a certain responsibility, having so strongly recommended the Thomas. With the exception of the carburetor getting out of order once, there was absolutely no trouble, and that was only temporary.

Very truly yours,

(Signed) J. L. KUSER.

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The Glasgow Herald says:—"From the pictorial point of view it leaves nothing to be desired, but one can be even more eulogistic in reference to its literary contents, which have ranged throughout the world in search of material, and given it an emphatic right to its sub-title—'A Monthly Review of Travel.'"

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An Invaluable Guide for Intending Motorists
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Profusely Illustrated on Art Paper

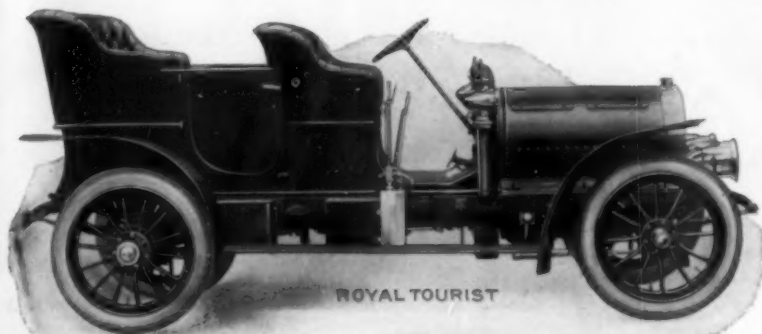
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Guaranteed
2500 lbs.

More Horse Power for Weight

No Better Car at Any Price

Agencies in all Large Cities. Write Dept. 7 for Catalog.

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FOR EFFICIENCY

WE CHALLENGE ALL OTHERS
DOMESTIC AND FOREIGN

AT THE AUTOMOBILE SHOWS, NOTICE

“Whitney” Chains

ON MOST OF THE LEADING CARS

RIVETED
TYPE



COTTER
DETACHABLE
TYPE

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SYNNESTVEDT MACHINE COMPANY

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Manufacturers of

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A. A. SCHANTZ, Gen'l Supt. & Pass. Traf. Mgr.
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Gas and Gasoline
Engines, Launches,
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Do away entirely with ALL starting and running batteries and their constant trouble and expense by using instead an

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No belt—no switch—no batteries. Can be attached to any engine now using batteries. Fully guaranteed and costs less than 50 cents per year to operate.

Write for descriptive booklet and testimonials.

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Save both by substituting motor-propelled business wagons for your horse-drawn vehicles.

We are making a specialty of the manufacture of

Electric Trucks and Gasoline Delivery Wagons

Correspondence from those interested in vehicles for passenger transportation is earnestly solicited. We can convince you that we have the best on the market.

TONNEAU BODIES, single and individual front seats, in the white or trimmed.

COMPLETE RUNNING GEARS for gasoline cars. Angle iron frames to meet specifications of purchaser. Artillery wheels, roller bearings, spur differentials.

We want to clear the above stock quickly, and will make prices to interest you.

THE AUTO-CAR EQUIPMENT CO., BUFFALO, N.Y., U.S.A.

XXX

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A Tale of Two Continents

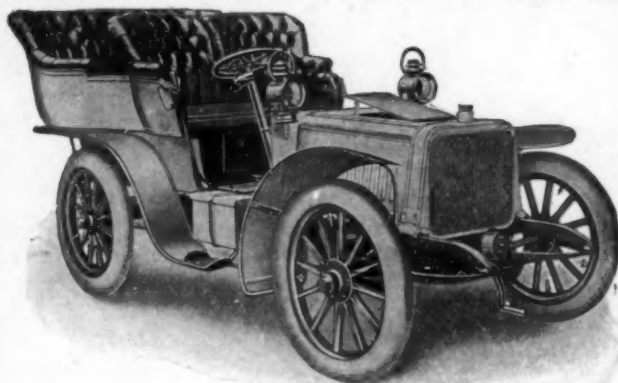


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MOTOR CARS

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30-35 H.P., 4 Cylinders, Model 1904.

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1 Kil Flying
29 2/5
1 Mile Standing
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ON HILLS
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AMERICA
DETROIT
September 8-9
5 MILES OPEN
- FIRST -
15 MILES SPECIAL
- FIRST -
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10 MILES OPEN 12
PROVIDENCE SEP 13
5 MILES OPEN 13
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- FIRST -
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OCT 31
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5 MILES FOR
Centimen Operators
5 MILES open to
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Product of the finest works in Belgium.

Imported to meet the demand for the highest possible grade of car.

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Equipped with every possible improvement, including the unequalled Jenatzy electric clutch.

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Permission to demonstrate the superiority which has made the **PIPE** car the favorite of the nobility abroad and of the experts in America is especially requested.



The Automobile Magazine

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The 'mounted' policeman gauges your rate of speed by means of a stop-watch. He really 'guesses' the time between two measured points. Guesswork is *not* good testimony in court—even in the hands of a policeman.

The Jones Speedometer attached to your automobile accurately registers your speed at all times. Court officials say this instrument is the only *practical* speed indicator in use to day. Real knowledge is the best evidence one can have—let the Jones Speedometer show your speed

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123 West 32d Street, New York

The Most Interesting Touring Territory in — AMERICA —

Long Island

"Where Cooling Breezes Blow"

Six Hundred Miles of Improved Highways.
Rolling Hills and Shaded Roadways along the Sound.

Beautiful Beaches and easy running beside the Sea.
Quaint Villages and Superb Estates.

In touch with New York City by train, telegraph and telephone.

SUMMER HOMES, a booklet describing Hotels and Boarding Houses, postage four cents.

LONG ISLAND, a handsomely illustrated descriptive book, containing also a list of Hotels and Boarding Houses, postage eight cents. Free on application, or mailed on receipt of postage by the General Passenger Agent.

LONG ISLAND RAILROAD

A. L. LANGDON, HOWARD M. SMITH,
Traffic Manager Genl. Pass. Agt.
263 Fifth Avenue, New York

Home-Made Fire Extinguisher

On the theory that an ounce of prevention is worth a pound of cure, this tip is of much value: Suspend from the top of the tank or room containing the gasoline by a string or fusible link, a bottle containing about one gallon of ammonia. Then if the gasoline takes fire the bottle will fall and be broken, releasing the ammonia and generating a gas which will promptly put out the burning gasoline.

Clean Your Car When It Comes In

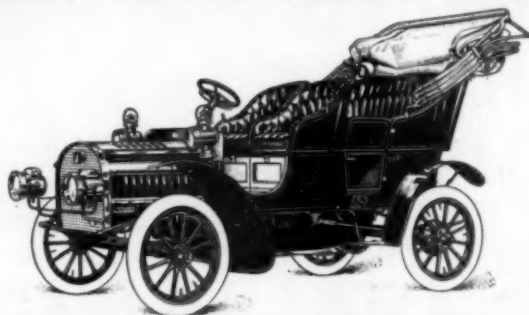
When a car has been out on muddy roads, it is always the part of wisdom to thoroughly cleanse the mud off with a hose and to properly finish the cleaning of the paintwork with a smooth wash leather. The reasons for this are fairly obvious, since if the car is put away without cleaning the mud from off it the mud dries on it, and much more labor and time are later on required to remove it. Again, when moisture or mud is allowed to remain on the car, it tends to dull the varnish, and what should otherwise appear as a smart turn-out will then partake of the nature of a shabby, dilapidated, second-hand affair, apparently not worth the amount which it really is worth. First appearances go a long way, and a good impression is always caused by a well-cared-for car. It is often necessary to run out at a moment's notice, and this is another reason why the car should always be left ready in every respect to take the road.

Germany's Use of Alcohol

There are 65,000 distilleries in Germany, where more alcohol is made than anywhere else in the world. Of the product of these distilleries last year nearly 30,000,000 gallons were used for industrial purposes (light, heat, and power), every gallon of which alcohol was produced from potatoes,

Rambler

Nearly every Rambler owner operates and cares for his own car because of the simplicity, reliability and accessibility of the mechanism. After all, this is the greatest pleasure of automobile ownership. To have the great power of the engines respond to the movement of a lever; to stop the forward movement and reverse, with a pressure of a foot; and to control both the speed and direction of the car, at the same instant, with the movement of one hand on the throttle and steering wheels - these are advantages not found in any other automobile.



SURREY, TYPE ONE.
 16-18 horse power, \$1350
 complete with lamps, tools, etc. Cape top, \$125 extra
 Other models \$750, \$850, \$2000, \$3000.

Main Office and Factory, Kenosha, Wisconsin.
Branches - Boston - Chicago - Philadelphia. New York Agency, 134 West
Thirty-eighth Street. Representatives in other leading cities.
THOMAS B. JEFFERY & COMPANY.

MOST CARS require A LOT of water to keep them cool; PREMIERS are cooled by air—the logical way—hence do not NEED the cumbersome paraphernalia which the others do—saving weight, time, repairs, cost. “Premier Quality” has become a sort of high standard by which to judge others, and we are having imitators—and flatterers. Buy a PREMIER and you buy satisfaction.

Send for catalogue and booklet of testimonials.

PREMIER MOTOR MFG. CO.
1005 Georgia Street
INDIANAPOLIS INDIANA

The “BARRETT” AUTOMOBILE JACKS

“Barrett's Patents”



are the accepted Standard. Quick-Acting, Automatic Lowering, Easily Operated. Lift One Ton, dead weight, and adapted to any automobile. The only substantial and reliable Automobile Jacks on the market, and they can be readily carried as part of the equipment of any automobile. SEND FOR CIRCULAR.

THE DUFF MFG. CO.

Works, Allegheny, Pa.

PITTSBURG, PA.

specially grown for the purpose, rough culture being employed, and quantity solely being aimed at. It has been estimated that at \$5 a ton for potatoes, alcohol could be produced, duty free, at 25 cents a gallon. In Germany an immense number of lamps, burning alcohol in incandescent burners and giving off a powerful light are in use, and cooking and heating stoves using the same fuel are in common use everywhere. As a motive power, 2,700 alcohol motors up to 25 H. P. have been made by one firm, and many of these motors have been in constant use, some working at times in a temperature far below zero without any apparent loss of efficiency. Alcohol and gasoline will not satisfactorily go together, gasoline being insoluble in alcohol, and the two spirits require different methods. In gasoline engines it is necessary to get rid of the heat thrown off; in alcohol a heating jacket is necessary, owing to the small heat unit. In England the Belsize people have been using alcohol in an experimental one-cylinder engine, which has proven so successful, that by spring they hope to have a three-cylinder car on the road, using alcohol alone.

In a four-cylindere engine try always to keep the four cylinders running evenly. Have all the valve springs of the same strength, and see that the tremblers on the coils are evenly adjusted.

Avoiding Downhill Side-Slip

Most drivers of any experience have at some time or another had experience of driving on slippery roads, and the novice will find, or has probably already found, that extreme precaution is necessary when descending winding hills, where the roads are greasy. There is one practically safe method of descending without danger, and this applies, of

The Incomparable **WHITE** The Car for Service

The White is favorite for use in the *country* because, with the steady even pull of its engines and its ever present reserve of power, it can over-



come any obstacle which may be encountered in touring.

The White is favorite for use in the *city* because, owing to its ease of control, it can be guided through the congested streets more readily than can any other car. The White is started, stopped, and run at any speed up to its maximum by a simple turning of the throttle.

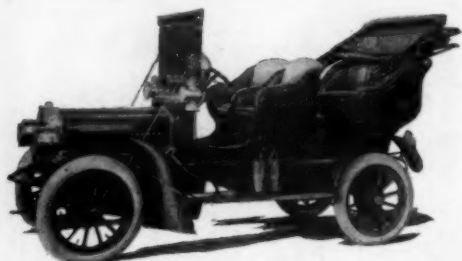
WRITE TO US FOR BULLETIN No. 9

WHITE SEWING MACHINE **COMPANY** CLEVELAND OHIO

The Wonder of the Shows

Col. Sprague's CANOPIES

EXCELLENT—MODERN—NOVEL

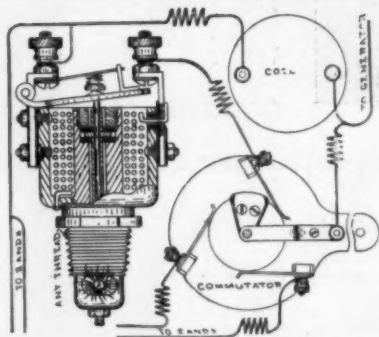


One of Col. Sprague's Cape Extension Tops closed down, leaving the glass front as a wind-break. The "Thomas Flyer" and many others will be equipped with these tops.

The Sprague Umbrella Co.
NORWALK, OHIO

Ask for Catalogue and Prices

THE NEW-DUR EXPLODER



If you do not have a DURYEA auto, it is quite possible that you have ignition trouble. This exploder has been designed to overcome spark troubles, and, like Duryea devices, it does it.

If you are a sufferer, write us.

DURYEA POWER CO.
30 C Street, Reading, Pa.

course, to slippery roads of any kind. It consists of driving with the wheels at one side in the gutter. If one wheel is already in the gutter there is very little tendency for the car to slip out of it. Again, if the car is close to the pavement, a slip of an inch or two into the kerb-stone is not much to worry about. As long as one wheel stays in the gutter it is impossible for the car to turn round and go broadside down the hill. In most cases at the side of the road and in the gutter there is usually to be found good holding which should be availed of.

To insure a good light from an acetylene lamp, it is important to keep the burner clean. This can very easily be done by dipping the burner in liquor potassæ. The burner should then be washed out with alcohol or gasoline.

A Fable

The Wealthy Patient was in a Quandary.

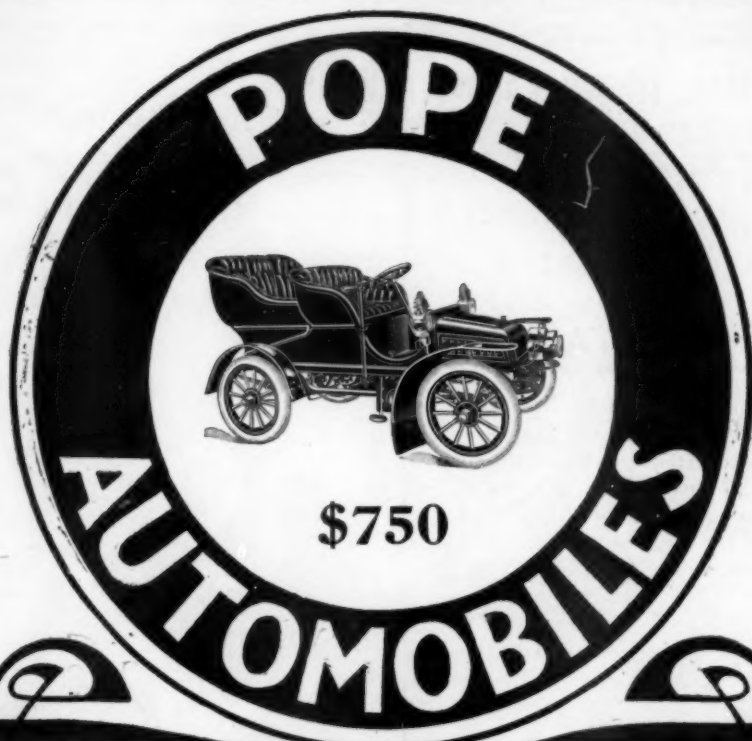
"The fee of the Eminent Surgeon will be \$1.99 more than I have in the Bank. If, however, I Die the Eminent Lawyer will take \$1.99 more than I Leave. Which shall it be?"

While he was still debating a Repairer did a few stunts to the Wealthy Patient's \$10,000 Automobile and received the Whole Estate.

Moral: When between the Devil and the Deep Sea a Third Party may get you.

On Selecting Lamps

When choosing an acetylene head light or kerosene side lights for use on motor cars, be sure and see that the front lens of the lamp can be renewed readily in case of breakage. When the lens or a plain glass front is fitted in solidly, the heat from the burner so acts on the lamp body and the glass that if the latter is not spring fitted the chances are that it will crack; the vi-



Best Bargain on the Market

POPE-HARTFORD, MODEL B, \$750

AS LONG AS THEY LAST

A thoroughly reliable and powerful 10 h. p. gasoline car, which will give you constant daily service. An exceptional hill climber.

IMMEDIATE DELIVERIES

It Costs Nothing for a Demonstration

Call on us, or let us send you catalogue and convincing data.

ADDRESS DEPT. A

POPE MANUFACTURING CO.

HARTFORD, CONN.

M. A. L. A. M.

American Motor League

IMPORTANT

The American Motor League is now collecting and compiling route information from all parts of the country, and will print Road Books for ten important States as soon as this information is completed. The League also proposes to establish a Route Information Bureau, from which information will be sent out to all inquiring automobilists by an expert employed for that purpose. The A. M. L. is the only organization which permits individual members (not members of clubs) to be represented by delegates at League meetings.

Recognized Automobile Clubs are received into the League on payment of a nominal fee only.

There is no initiation fee. The annual dues paid by each member is two dollars.

Full printed information relating to the League, and its object, will be sent on receipt of postal-card request.

American Motor League

Vanderbilt Building

New York City

bration may in any case crack it. The glass can be immediately renewed without returning the whole lamp to the manufacturer, if a split spring ring is fitted to hold glass in place; the ring also allows of any expansion due to heat. On many occasions when a lamp glass has been found cracked, the excuse has been given that the glass has been injured by coming in violent contact with some hard substance, whereas in the majority of cases the breakage has been entirely due to the causes given above.

A man's reputation for being a motor expert depends less on what he really knows than it does on what he doesn't say.

Cheery Chant of the Imported Chauffeur

I'm the cheerful, chaffing, imported chauffeur,

Dread foe to common, everyday humanity.

And everywhere I whizz you'll hear a stir

Of pale-blue, objurgational profanity. I love to hear the fool dogs' bodies crunch

And titulate my tired wheels pneumatic;

To know I am the warmest of the bunch

And hand out brands of fate aristocratic.

Watch that man who tried to cross!

Didn't he have a gall?

Hark the Yuletide chiming of the ambulance's call!

Here's a leg, and there's an arm, and eke a spinal section.

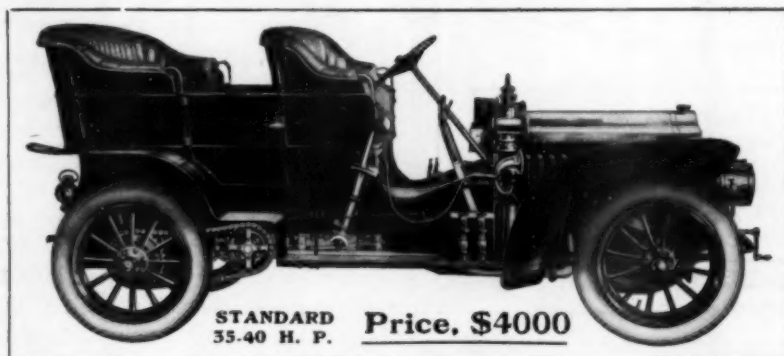
Oh, for a bone occipital to add to my collection!

A group of ladies leave the open car.

They hesitate a moment on the crossing.

I'm 'mongst them ere they see me from afar;

The name *Columbia* is a synonym of leadership and the maximum of merit in automobile construction. The element of chance does not enter into the purchase of a *Columbia*. Each model stands for known quantities and the highest qualities.



STANDARD
35-40 H. P. Price, \$4000

Columbia 35 - 40 H. P. Cars and 18 H. P. Cars

are America's most representative automobiles in the gasoline class. They are built for practical work and claims for their superiority are not based upon the performance of specially constructed racing machines.

COLUMBIA ELECTRIC CARRIAGES provide the most convenient, luxurious and the safest conveyance for town service.

COLUMBIA COMMERCIAL VEHICLES cover the whole range of business motoring, from light delivery to the heaviest trucking.

A special catalogue is issued for each of the three COLUMBIA classes. Sent to any address on request.

Electric Vehicle Co., Hartford, Conn.

NEW YORK	BOSTON	CHICAGO
134, 136, 138 W. 39th St.	74, 76, 78 Stanhope St.	1413 Michigan Ave.

Member Association Licensed Automobile Manufacturers

AUTO TOURISTS 4 FOR 5

COMBINATION OFFER

DUSTER, Value, . . \$2.00
CAP, " . . . 1.00
GAUNTLET GLOVES, 1.50
GOGGLES, . . . 1.75

The FOUR for \$5.00

CASH ONLY

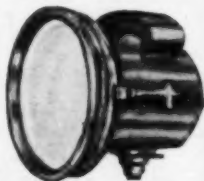
STATE SIZES AND WRITE
ADDRESS PLAINLY . . .

THE MOTOR CAR SUPPLY CO.
1427 Michigan Avenue, CHICAGO

SOLAR MOTOR LAMPS

THERE'S worse than speed laws for the man who likes to go fast at night. There! dubious lamps.

Moral—
The SOLAR
An illustrated
book giving
prices for the
asking.



Badger Brass Mfg. Co.
KENOSHA, WIS.
NEW YORK OFFICE, 11 WARREN STREET

An inquest job motoring's foes can be bossing.

Hurrah! There go two messenger boys,
Whose loafing 'round the streets is
not advisable.

Behold me waft them to celestial joys!
I'll bet nine cents they're both unrec-
ognizable.

"Hoch der lieber auto man!" sing we
merrily.

You may sidestep fate and taxes, but
you can't sidestep from me.

I get a curse from every one, from
heathen or from Quaker,

But only smiles await me from the
genial casket-maker.

How to Protect the Bright Parts

When a car has to be driven through the rain a lot of subsequent work and worry can be avoided if all bright parts are given a coat of vaseline or similar moisture resisting substance. With such a coating there is no necessity for wiping down and polishing all of the bright parts the moment you reach home, since the grease prevents the rain from spotting and tarnishing the metal work while it may be readily removed at any time. Should any plated parts become tarnished they may be restored to their previous brightness by the use of any good polishing paste and a little liquid ammonia.

A man is beginning to lose confidence in his theories when he is unwilling to listen to arguments against them.

Neutralizing Spilt Acid from Batteries

Should any acid from the accumulators be spilled it is advisable to stop it immediately. The procedure varies considerably with different accumulators. If it is impossible to stop the spilling, the action of the acid will set up corrosion and spoil the adjacent fittings, if it does no worse. A correspondent writes that he covers the bottom of his battery

By Royal
Warrant
to His
Majesty
The King



Over
50 Gold
and Prize
Medals
Awarded



Dewar's Scotch Whisky

"SPECIAL" and "WHITE LABEL"

(The Fine Old Highland)

(The Whisky of Great Age)

JOHN DEWAR & SONS, Limited

United States Branch: Knickerbocker Trust Building, Fifth Avenue
and 34th Street, opposite Waldorf-Astoria, New York

FREDERICK GLASSUP, SOLE AGENT

ACME MOTOR CARS

- Sure Starting
- Sure Stopping
- Sure Going
- Sure Coming

Reliable in any emergency—in any weather—on any road.

TYPE VIII. Fastest Touring Car in the world at the price. Complete, \$2750.

TYPE X. A Runabout built like a Racing Car. Completely equipped, \$1000.

Demonstration in Ten Cities.

ACME MOTOR CAR CO., READING, PA.

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ESSIGN & MOORE	Binghamton, N. Y.
DEVLIN & CO.	Chicago
SOUTHERN AUTOMOBILE	Atlanta, Ga.
T. C. BRADFORD	Wilmington, Del.
BOSTON MOTOR CO.	Boston
LIBERTY AUTOMOBILE CO.	Pittsburg
ACME MOTOR CAR CO.	Philadelphia
ACME MOTOR CAR CO. OF N. Y.	New York City



Across
Lake Erie
Between
Twilight
and
Dawn

THE D. & B. Line Steamers Leave Detroit daily at 5.00 p.m. (central time) and Buffalo daily at 5.30 p.m. (eastern time) reaching their destination the next morning after a cool, comfortable night's rest en route. By special arrangement all classes of tickets reading via the Michigan Central, Wabash and Grand Trunk Railways, between Detroit and Buffalo, in either direction, are optional and will be accepted for transportation on the D & B. Line.

Detroit & Buffalo Steamboat Co.

A. A. SCHANTZ, Gen'l Supt. & Pass. Traf. Mgr.
Detroit, Mich.

boxes about an inch deep with bicarbonate of soda. This is an alkali, and neutralizes the acid. Being a clean white powder, it can be left in the box and does no harm, while it is ever ready for each spot of acid that splashes out. This substance is a simple and cheap one, and work can be done on the spot immediately the bicarbonate has been applied, which is not the case with ammonia, owing to the strong fumes given off. The bicarbonate can be purchased at any grocery or drug store, and quite a lot of it can be bought for ten cents.

Please note and do not forget it that any woman who is injured in an auto wreck is beautiful.

When Julia Motes

(Two Points of View)

I.—THAT OF THE POET WHO AFFECTS THE SEVENTEENTH CENTURY

When in her motor Julia goes,
How soft the air that round her blows!
Just ruffling on her forehead fair
The golden tendrils of her hair.
Bright as the Dawn's first rosy streak,
Blushes through gauzy clouds her
cheek,
The roguish Loves in eager flight
Are snared within the tangles light
Of filmy scarf, that fluttering floats
When Julia motes.

The Goddess in her dove drawn car
Less fleet than Julia is by far!
My lady's chariot hath no need
Of peacocks, doves or prancing steed,
Upon a wheel her slender hand
She lays, and swift at her command
It flashes forward like the wind,
The Gazer turns to look behind,
"Dea in Machina!" he misquotes
When Julia motes.

Thus, like a conqueror, proud and gay,
She drives on her triumphal way,
And binds, despite my fond appeals,

Refinement is the Aim of the
Maker of Electric Carriages

The
BAKER

Is acknowledged to be of par excellence



Simplicity and minimum friction contribute to make the **BAKER** the lightest and easiest running electric car in the world. The finish of our vehicle is acknowledged to be unsurpassed. Our line includes all the popular types. Catalogue sent upon request.

Baker Motor Vehicle Company
CLEVELAND O H I O

Modoc Automobile Cleaner

Cleans thoroughly and restores the lustre without affecting the varnish. It is without doubt the best automobile cleaner on the market. Sample and directions furnished on application. Price per gallon, \$1.00, f. o. b. Chester; packed in tin, wooden covered cans

AGENTS WANTED

The Henry Roever Co.
CHESTER, PA

Special Announcement

AN INVITATION is extended by the management of the HOTEL GALLATIN to any white merchant or his representative outside of New York City, whose name appears in Bradstreet's or Dun's Commercial Agency Book, to accept the hospitality of the Gallatin Hotel, 70 West 46th Street, for three days without charge. Usual rates, apartment with private bath, \$3.00 per day and up, without meals. Parlor, bedroom and private bath, \$35.00 per week and up, with meals for two : : :

GALLATIN HOTEL
70 W. 46th St., New York City

Me captive to her chariot wheels,
While Cupid o'er my anguish gloats
When Julia motes.

II.—THAT OF THE TWENTIETH CENTURY REALIST

When in her motor Julia goes,
What smut begrims her pretty nose!
How rough and out of curl her hair!
Her eyes through owl-like goggles glare,
Her heralds are the hideous shriek
Of horn and gaso's noisome reek,
We see approach a shapeless fright
With head in duster tied up tight,
Arrayed in baggiest of coats
When Julia motes.

The Scorchers, in his racing car,
Less rash than Julia is by far!
Through streets and roads at topmost speed

She loves to dash, and takes no heed
Of regulation or command;
But, scorning those who bid her stand,
Flies onward, fearing to be fined,
And leaves a cloud of dust behind,
We splutter, gasp and clear out throats
When Julia motes.

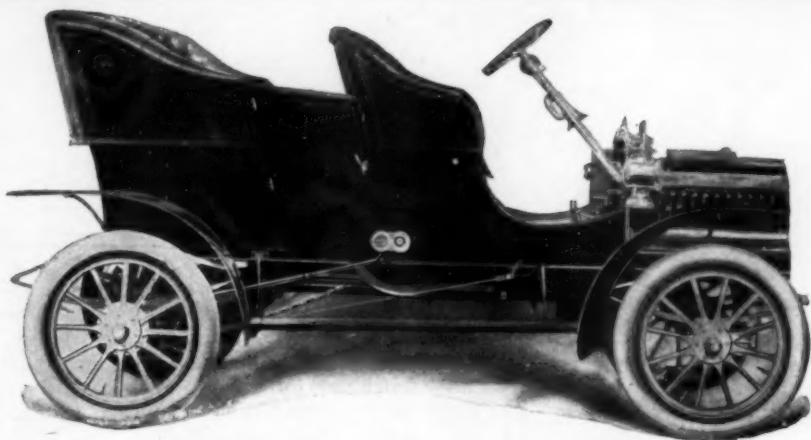
Thus, to the wayfarer's dismay,
She rushes on her reckless way,
And crushes, careless of their squeals,
And dogs and hens beneath her wheels;
Her number the policeman notes
When Julia motes.

Called Back

"Did you hear how Scorchmore passed the critical point in his fever?"
"No. How was it?"

"Why, just as he neared the anxious moment the doctor had the boys run his touring car up the stairs and into the sick man's room. Scorchmore was just going when he caught the odor of the gasoline. He straightened up, gave one long sniff, smiled ecstatically, and then dropped back in a refreshing sleep."

THE FORD



Model F, Price, \$1200

In addition to Henry Ford's originality of design there is more actual value of material and workmanship in FORD MODEL "F" than in any other automobile ever built at the price.

It seats five people, climbs hills on high speed, has a roomy side entrance tonneau, is light, strong and rides like a yacht. Has the latitude of speed on the high gear of a \$5000 car.

If you are thinking of buying a \$700 or \$800 car, put a few hundred with it and get a Ford Model F. If you think a \$2000 to \$2500 car is necessary, save \$800 to \$1200 and buy a Ford Model F.

Mr. Automobile Buyer, keep this in mind. Big Touring Car bodies on cheap, roughly built chassis, will look like you are getting a lot for your money, but new sets of tires at \$160 to \$200 per set, big repair bills, clattering machines struggling with little hills, will convince you that something besides bigness of looks is to be considered in buying an Automobile.

When you buy a motor car look at all the cars. Find out what they *will do* and *what they have done* in actual service. Get demonstrations on the road. Select difficult roads and steep hills. Don't let a slick salesman spin you along on an asphalt pavement. After you have found what others will do, go to the Ford agent and ask him to take you out in a Ford. If it doesn't do as good work as a car costing half as much again, and better work than any car at the same price, our agent won't have a word to say.

If you don't know who our agent is, write and ask us and get our little booklet on Maintenance and what it costs to run a Ford.

FORD MOTOR CO., Detroit, Mich.

Canadian Trade Supplied by Ford Motor Co. of Canada, Limited, Walkerville, Ontario

Members American Motor Car Manufacturers Association, Chicago

Don't Experiment ————— Just Buy a Ford

In answering advertisements please mention THE AUTOMOBILE MAGAZINE.

XV

**ASK
and
FIND
OUT**

NO MATTER what you want to know about an automobile, its power, maker, price, stability, suitability, or anything else, can be quickly ascertained at no additional expense other than for the postage employed in stating your difficulties

TO THE

**Information
Bureau**

OF

The Automobile Magazine

136 LIBERTY ST., NEW YORK CITY

WE DO not claim to know it all, but what we don't know we can find out for you—perhaps better than you can for yourself.

If you are having more than your share of motor troubles we can probably help you. Don't be bashful—send in your queries.

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SYNNESTVEDT MACHINE COMPANY

PITTSBURGH, PA.

Manufacturers of

Electric Vehicles

DELIVERY WAGONS

SURREYS

STANHOPE'S

BUSES

TRUCKS

Eastern Branch, 1005 Drexel Bldg., Philadelphia
Commercial Automobile Co., Distributors, 1336 Michigan Ave., Chicago



LAKEWOOD for GOLF

REACHED ONLY BY

NEW JERSEY CENTRAL

FINEST LINKS

BEST HOTELS

EXCLUSIVE PATRONAGE

BOOKLET ON APPLICATION TO
C. M. BURT, GENERAL PASSENGER
AGENT, 143 LIBERTY STREET
NEW YORK CITY.

TIME IS MONEY

Save both by substituting motor-propelled business wagons for your horse-drawn vehicles.

We are making a specialty of the manufacture of

Electric Trucks and Gasoline Delivery Wagons

Correspondence from those interested in vehicles for passenger transportation is earnestly solicited. We can convince you that we have the best on the market.

TONNEAU BODIES, single and individual front seats, in the white or trimmed.

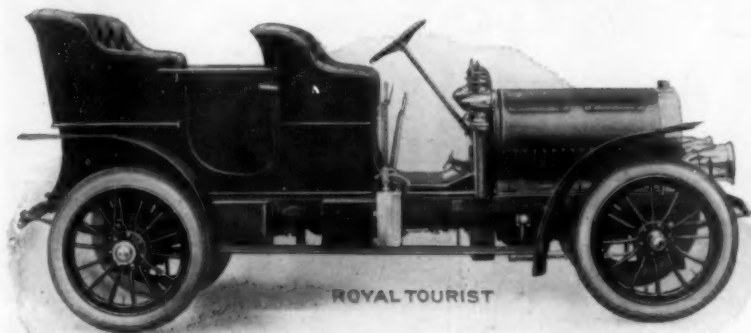
COMPLETE RUNNING GEARS for gasoline cars. Angle iron frames to meet specifications of purchaser. Artillery wheels, roller bearings, spur differentials.

We want to clear the above stock quickly, and will make prices to interest you.

THE AUTO-CAR EQUIPMENT CO., BUFFALO, N. Y., U. S. A.

The Royal Tourist

— TRUE BLUE —



\$3000

32-38 H. P.
Guaranteed
2500 lbs.

More Horse Power for Weight

No Better Car at Any Price

Agencies in all Large Cities. Write Dept. 7 for Catalog.

THE ROYAL MOTOR CAR CO., Cleveland

Duryeas Are Right

EVERY detail of the DURYEA has a good scientific reason for its existence. Get our leaflet, "The Reason Why." You have had tire troubles, of course. Did you ever stop to think that a big wheel rolls over the rough spots easily, but a wide tire picks up all the tacks? That's why we use 36" x 3" wheels. Simple, isn't it? Write for leaflets.

DURYEA POWER CO.

30 C STREET

READING, PA.

You Couldn't Spend

\$2 to a better advantage
than to send it now for

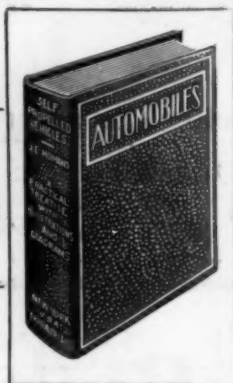
A YEAR'S SUBSCRIPTION TO

The Automobile Magazine,

136 LIBERTY STREET

Just Issued

Price
\$2



Price
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A popular edition for owners, operators, repairmen, intending purchasers and all interested in automobiles. Address Book Dept.

AUTOMOBILE MAGAZINE
136 LIBERTY STREET NEW YORK



Do You Know What to Do and How to Do It

When your Gasoline motor or gas engine gets stubborn? This can be quickly learned by consulting the

Practical Gas Engineer A Book of 150 Pages

By E. W. LONGANECKER

Twelve years' constant experience with Hydro-Carbon Engines.

SENT POSTPAID ON RECEIPT OF PRICE, \$1.00, BY THE

BOOK DEPARTMENT, AUTOMOBILE MAGAZINE

**AUTOMOBILE TRIALS
MOTOR-BOAT TRIALS**

No. 1

Conducted in a scientific and practical manner. Gas engines and gas engine appurtenances tested thoroughly. Engines or complete Automobiles designed. Inventions developed.

HIGH-SPEED TWO-CYCLE ENGINES A SPECIALTY

E. W. ROBERTS, M. E.

Box 324

Consulting Gas Engine Expert

CLYDE, OHIO

Leon Rubay

Sole Importer
J. Lacoste & Cie *of Paris, France.*
 Maker of the Finest Apparatus in the World for
Electrical Ignition of Automobiles



Lacoste High Tension Magneto (for jump spark ignition)
 Low Tension Magneto
 Accumulators
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 Many other specialties

Also Importer of Zanardini Lamps
 Rubay Basso Horn

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140 W. 38TH ST. NEW YORK
Cable "Yabur" N.Y.

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ST. LOUIS CARS, 1-2-3-4 Cylinders
 Prices from \$1300 to \$2200
 Models to Suit Every One

a problem half finished, while simplicity is the work of a true genius. The now often heard phrase (made good) was coined by satisfied users of ST. LOUIS cars. Remember this when placing your order. *Catalogs free.*

St. Louis Motor Carriage Co.
 1211-1221 N. Vandeventer Ave.

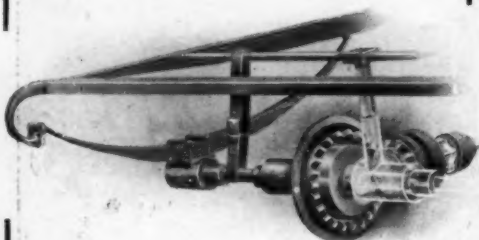
ST. LOUIS, MO.

Talk is Cheap

but facts are what count in the automobile business. Many customers are prone to buy a locomotive because some of their wealthier friends have one, and then kick on account of repair bills. There is a happy medium to be had by owners, and when you avoid the cheap runabouts, don't make the mistake of paying three or four prices for complicated power which you can never use. Unnecessary mechanism is

HAYNES

New Roller Gear and Sprocket



Combines the virtues of chain-driven sprockets and beveled gears. Two rollers are always engaged with the sprocket teeth. By this invention the thrust is eliminated.

This new Roller Gear and Sprocket is an epoch-marking improvement. It marks the passing of rear axle troubles if your car is a HAYNES.

Write for catalogue, showing all models.

THE HAYNES - Apperson Co.
KOKOMO, IND.

NEW YORK BRANCH: 1715 BROADWAY
CHICAGO BRANCH: 1420 MICHIGAN AVE.

MEMBER A. L. A. M.



"Century"

Ask your dealer to show you the best camera in the market today, for both plates and film. If he does, it will be a "Century."

The 1904 Models have a **Revolving Back** — the most useful and valuable improvement made in recent years.
Complete Catalog *free* for the asking.

CENTURY CAMERA CO., Rochester, N. Y.

America's Famous Resort

Atlantic City

Three Hours

from

New York

VIA

New Jersey Central

*Solid Vestibule Equipment
Buffet Parlor Cars*

TRAINS AT - - - 9:40 A. M. — 3:40 P. M.
SUNDAYS, 9:40 A. M.

STATIONS { Foot Liberty Street, N. R., and
South Ferry

Illustrated book on application

C. M. BURT, General Pass. Agt., New York.

May 12, 1905.

MARTIN & HART MOTOR CO.
Agents E. K. Thomas Motor Co.
PHILADELPHIA, PA.

Gentlemen:

It gives me pleasure to state that I have driven my Thomas 40 H.P. car over 1900 miles, and during that time have not had to spend more than \$9.25 all told for repairs to same. I have not even taken out a spark plug, and in fact have done absolutely nothing to the car but to have it washed and filled with gasoline, water and oil. This statement seems strong, but it is nevertheless true, and it is therefore all the more wonderful. This seems to prove that the Thomas cars are more reliable than any car made, at least so far as my experience has been.

Yours very truly,
(Signed) J. EVERETT MEHRER.

STERLING ELLIOTT AUTOMOBILE TURNTABLE



Indispensable to every well regulated garage. It is equally well adapted for concrete floors built directly on the earth or for upper floors; the only encroachment on the head room below being the two supporting beams which drop 18 inches, if made of wood, and still less where steel is used. The revolving surface may be either wood, concrete, tile or metal.



Gibbs, Brower Co.
150 Nassau Street.
NEW YORK

Touring Department

THE AUTOMOBILE MAGAZINE has a Touring Department in charge of an expert who goes personally over the routes he advises you to take. No matter what you want to learn about Routes, Roads, Equipment, etc., you can be sure of getting it right when you address an inquiry to the

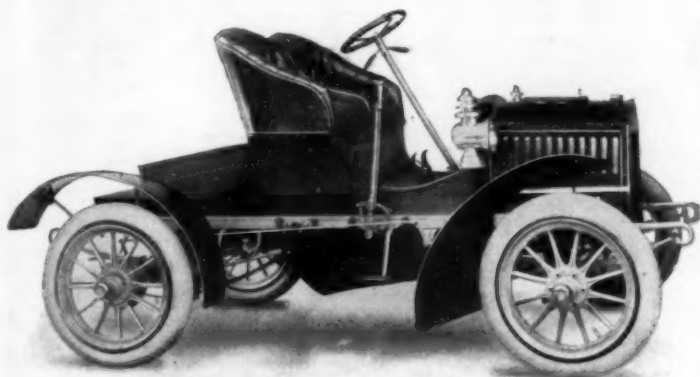
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NUMBER 136 LIBERTY ST., NEW YORK

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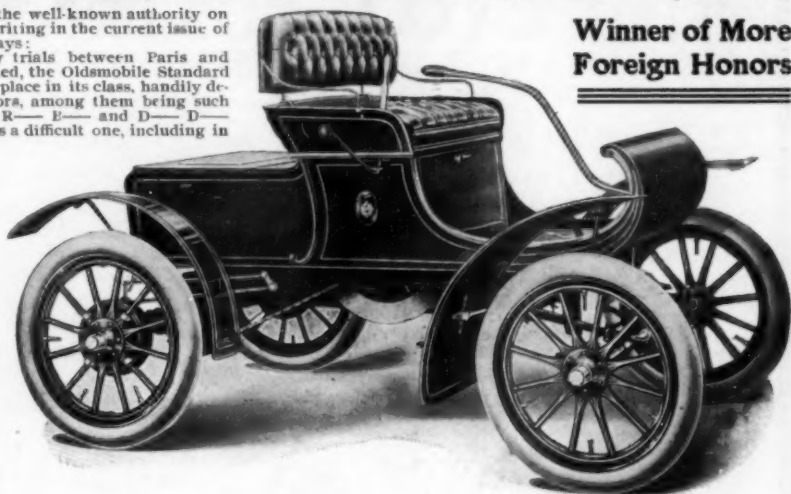
In the transcontinental race from New York City to

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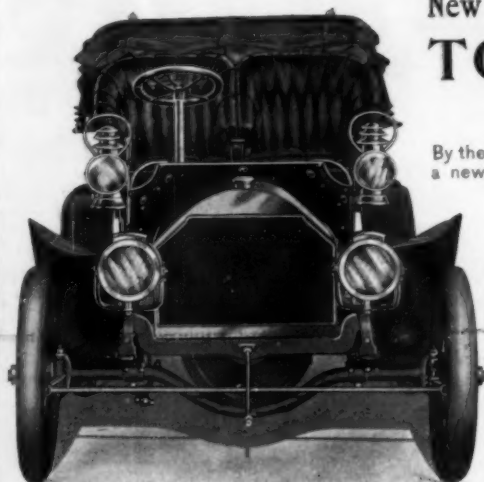
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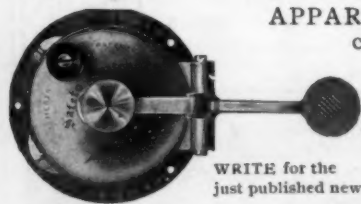
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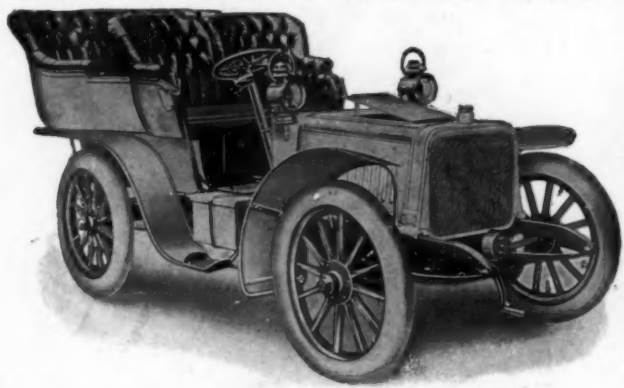
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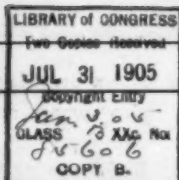
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The
Automobile Magazine

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Drivers who wear spectacles and whose cars are equipped with a glass wind screen find it easier to see through the screen when it is wet than to see through spectacles when they are in the same condition. The explanation that first occurs to one is that a drop of rain falling on a lens close to one's eye covers a very large part of the area of vision. But the weak point of this theory seems to be that when the rain is so heavy as to make the whole surface of the glass screen uniformly wet, it can be seen through better than one could see through spectacles if they were similarly covered by a uniform film of rainwater. Perhaps the oculist's explanation would be that the glass screen is flat, so that the rain upon it does not distort the angles of vision, but rain upon the lenses of spectacles causes a kind of refraction which destroys the vision-correcting angles at which the lenses are ground.

Every man has a right to his own opinion of an automobile, but the trouble is that comparatively few of them have anything more than the right.

Long vs. Short Wheel Base

The question of the merits of a long wheel base in a car is one which is open to discussion. Its advantages, in brief, consist in its effect as an absorber of vibration, the facilities it affords for increased passenger space without encroaching on the engine room, diminution of side slip and steadier running. The drawbacks include increased difficulty when required to rapidly turn, the addition of extra and useless weight, and its liability to cause distortion of the frame. Some of the accepted advantages of the long wheel base are obtainable by the choice of suitable coach type springs on condition that their resiliency is controlled by suitable means. An attempt to secure this has been made



Pope-Hartford Model B

\$750

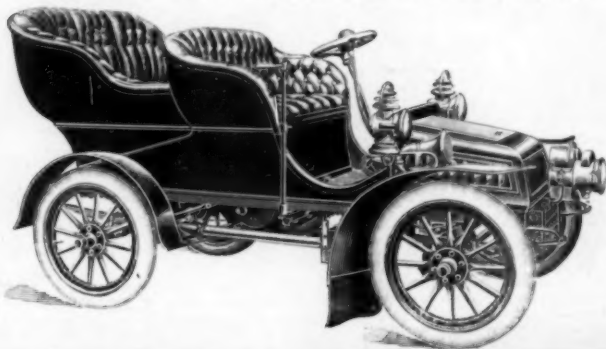
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by supporting the entire carriage work from one line on the chassis which gives a pivoting or rotating movement about that line, and while the results of this have not been all that might be desired, the road shocks were unquestionably modified into a pleasant movement of an undulating character.

It was an enthusiastic road reformer who said: "We want good roads, and we want 'em bad!"

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When the owner of a car has become somewhat expert in the running of the vehicle it will be found advantageous for him to gradually cut down the gasolene feed until the point is found at which the motor runs well, but will not stand a further reduction. The smaller the proportion of gasolene the more economically the motor will run and the cleaner it will keep. This can, of course, be carried to extremes and the efficiency of the engine interfered with; but the proper feed can be determined without great difficulty. The same process should be applied also to the cylinder lubrication. When the gasolene and lubricating oil are feeding into the cylinder in the smallest quantities that will produce good results, the motor should run for a long time without fouling the sparking plug and on the minimum amount of fuel.

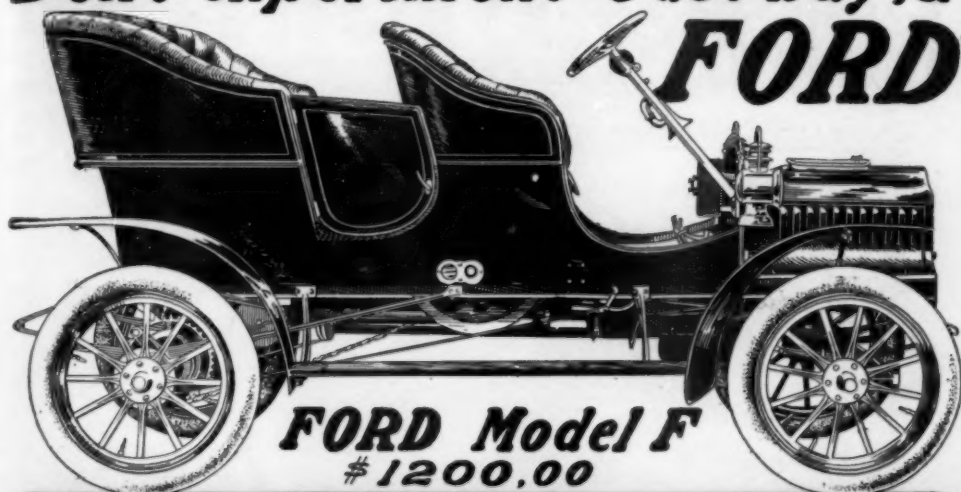
Of course in motoring, many men, naturally, have many minds; but it does seem too bad that the other fellows should so often be so radically wrong in their opinions.

When the Castor Holds a Real Friend

Proper lubricating oil is a prerequisite if the best results are to be obtained from any. At the same time there are a number of expedients that can be made use of at a pinch. To get one

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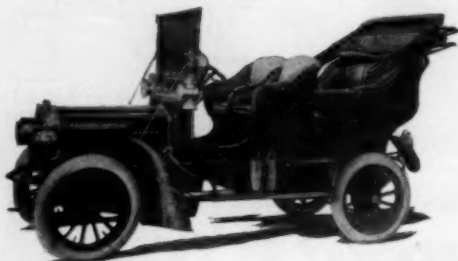
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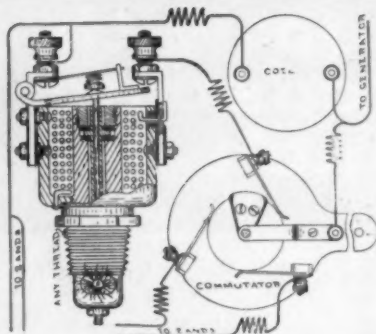
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DURYEA POWER CO.

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home when stranded through a shortage of oil almost anything that goes by the name of lubricating fluid will do; even salad oil has been known to answer when nothing else was available. And, expensive as it was, it proved infinitely better than some of the heavy oils obtainable at chance roadside stores. The latter not only give poor results, but they leave the crank chamber or bearing in bad shape. The proper way is to open the drip cock or otherwise run the residue off and then thoroughly clean the parts by sluicing them with kerosene, so as to have them clean and sweet before putting in a supply of fresh lubricating oil.

It is easier to kick up a row with other users of the highway than it is cheerfully to accept the kicks resulting therefrom.

Importance of the Flywheel

The necessity of giving more attention to the flywheel is dwelt upon by M. Gaillardet, the famous French expert, according to whom the flywheel should be looked upon as an accumulator of energy capable of giving up a certain part of its energy to overcome inertia when starting a car. In other words, more power may be needed to start the car than that developed by the motor itself, and thus during, say, a quarter of a second the energy stored up in the flywheel is added to the power of the motor to move the vehicle. For this reason the weight of the flywheel should be calculated according to the inertia to be overcome—that is to say, the weight of the car and the speed at which it is started.

The best French theory is now greatly in favor of high compression on account of the higher efficiency it gives to the engine, but in practice it is impossible to exceed a certain limit, because very high compression would mean great difficulty in starting the motor and

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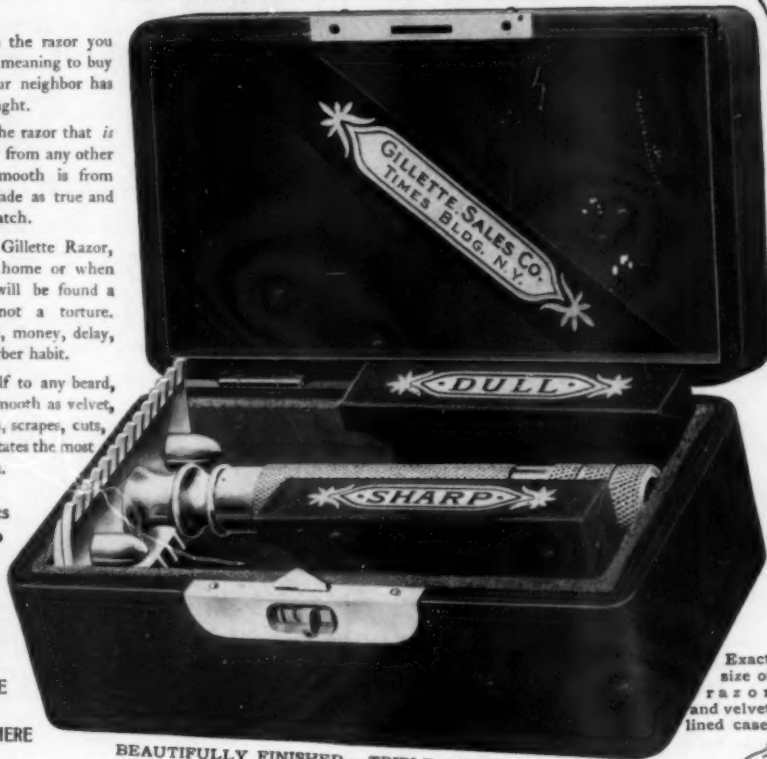
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Recognized Automobile Clubs are received into the League on payment of a nominal fee only.

There is no initiation fee. The annual dues paid by each member is two dollars.

Full printed information relating to the League, and its object, will be sent on receipt of postal-card request.

American Motor League

Vanderbilt Building

New York City

in regulating the admission, while with small flywheels the force of the shock would cause the motor to run irregularly, and it would be nearly impossible to avoid leakages at the valves and joints. For these reasons the compression ought not to be much more than five pounds per square inch. M. Gaillardet also concludes that the motor gives highest efficiency with a comparatively long piston stroke and high lineal speed, and in this respect he is somewhat at variance with current practice, which gives a preference to short stroke motors.

Dumas' Failure

The Count of Monte Cristo was sulking.

"Dumas may think he's given me enough money," he muttered, "but how about owning a record holding racing car or two?"

Still grumbling, he debated whether or not to strike.

An Auto Lullaby

Hush-a-by, baby, let sleep softly steal,
Mother is driving her automobile,

Sleep as the autocar jiggles and joggles,

Baby is wearing her cute little goggles,

Wrapped in her little warm, pretty warm rug,

List to the motor go: "Chug-a-chug, chug."

Sleep, pretty babykins,

Wrapped in a rug,

Dear little babykins,

Snuggled as a bug.

Hush, deary babykins,

Chug-a-chug, chug.

Hush, little baby and rest in the car,
Mother is driving her auto afar.

Over the roadways like birds we are flying,

Swift as the winds, and with winds we are vying.

The Incomparable **WHITE** The Car for Service



Steam is Supreme

The first car to complete the Chicago-St. Paul trip was the White steamer driven by Walter C. White. The car left Chicago Saturday morning and reached St. Paul early Monday evening. The time spent on the road, not deducting any time for stops, was 43 hours 56 minutes. Less than two hours were spent on the road after dark.

The second car to complete the trip was the White steamer driven by H. K. Sheridan and C. R. Misner. The car arrived in St. Paul at 10:30 A. M. Wednesday.

The superior performance of these two machines demonstrates that the White is beyond doubt the best machine for country roads.

On July 3d and 4th, at New York, the White racer, driven by Webb Jay, won all the championship and special match races, and placed the mile world's record at 48½ seconds.

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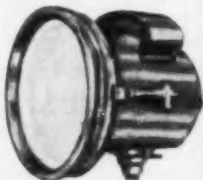
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An illustrated
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asking.



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KENOSHA, WIS.
NEW YORK OFFICE, 11 WARREN STREET

Nothing can harm and nothing molest,
Drive we away to the country of rest.

Sleep, pretty babykins,
Wrapped in a rug,
Dear little babykins,
Snug as a bug.
Hush, deary babykins,
Chug-a-chug, chug.

Hark, little baby, we skim like a breeze,
Under the branches of sheltering trees,
Over the turnpike, and over the prair-
ies,

Floating along like the fleet-footed
fairies

Up on the hilltop and then we rush
down,

Far from the rush and the roar of the
town.

Sleep, pretty babykins,
Wrapped in a rug,
Dear little babykins,
Snug as a bug.
Hush, deary babykins,
Chug-a-chug, chug.

On Steep Declines

When descending a long, steep hill,
particularly if the route is unfa-
miliar, it is a good plan to put the low
gear in before starting down, and then
stop the motor—usually by switching off
the ignition current. The foot brake can
now be put on sufficiently to disengage
the clutch. In case the brakes fail to
keep the car from attaining too high a
speed, the motor may be used as an
emergency brake by allowing the clutch
to engage. This will prevent the car
from attaining an excessive rate of
speed, inasmuch as the movement of the
car will rotate the motor against com-
pression.

Unappreciated Lavishness

"Whenebber a man gibbs me a whole
lot o' advice," said Uncle Eben, "I
can't help s'picionin' dat if his opinions
was so valuable he'd be busy some-
wha' else countin' money."

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Detroit & Buffalo Steamboat Co.

A. A. SCHANTZ, Gen'l Supt. & Pass. Traf. Mgr.
Detroit, Mich.

Look Well to the Tool Box

No matter how much care is bestowed upon a motor-car, defects are bound to occasionally develop in it while on the road, and it is then that the mechanical resources of the motorist are taxed to their utmost. His material resources are generally very limited, comprising the few tools and supplies which he can carry in the tool-box, together with whatever he can beg, borrow, or buy along the highway. His mental resources are drawn upon in proportion to his paucity of material aids. Despite the small space usually available, quite a number of useful tools and supplies may be carried upon the vehicle, and, if the contents of the tool-box be well selected, a great many emergencies can be successfully met.

Permanently Affected

"Were you ever in an automobile accident?"

"Well, I should say I was! My wife accepted me while I had her out riding in that big touring car of mine."

Don't Twist Steering Wheel

The moving of the steering wheel while the vehicle is at rest tends to unduly strain the joints between the steering handle and the front wheels—in fact, the steering of a car should never be forced round unless the car is under way, however slightly. Of course, there may be cases when it is difficult to avoid turning the steering while the car is at rest, especially when turning in narrow roads; but as far as possible the rule should be adhered to of never forcing round the steering until the wheels are moving, especially on a rough road, or in places where the wheels are sinking somewhat into the ground.

Slowing Down by the Throttle

Both throttling and ignition have direct relation to piston speed and the power developed by the engine. Throt-

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June 27th, 1905.

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Gentlemen:

In justice to the remarkable performance of your tires in the 1000 mile record accomplished on our 40 H. P. Decauville driven by Guy Vaughan at the Empire City track, June 23d and 24th, we wish to say that notwithstanding the unfortunate series of punctures which marred the former attempt, due entirely to the plentiful supply of nails, wire and other hardware on the track, we never wavered in our firm opinion that Continental Tires were the tires for this arduous record, and we are now pleased to tell you of the truly wonderful record made by your tires, two of which were not even pumped up during the entire 1000 miles and finished in very good condition. On the other two tires we had a total of three punctures, which delayed us a total of 15 minutes and 14 seconds. We consider this record as establishing an entirely new precedent for tire endurance, and feel that a long time will elapse before it is equalled. In view of this we feel you are entitled to this unsolicited testimonial.

Yours very truly,

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GALLATIN HOTEL
70 W. 46th St., New York City

tlings should be resorted to whenever it is desired to limit the engine power developed. With a properly adjusted throttle it is possible to run the engine quite slowly, and at two-thirds of the consumption of gasoline generally used. One great advantage of throttling is that it enables you to run in crowded streets and on slippery roads on a higher gear than would otherwise be possible without undue engine speed. This practice is essentially economical, and lessens the heat developed in the cylinders to some extent. Thus, in traffic when a slow speed is necessary, the engine does not get hot to the same extent, and when in the open country the throttle can be adjusted to exactly regulate the pace desired. After a comparatively high speed has been attained, it is wonderful how much throttle can be closed without the pace slackening. It should be remembered that sparking should never be used as a means of retardation of piston speed. In saying this, of course, is meant the engine should not be slowed down by means of the sparking being retarded, but the sparking should be always kept at the most economical point of the explosion, which naturally varies according to the piston speed.

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Brown—So you lost your money in that patent automobile scheme. I thought they let you in on the ground floor.

Jones—Well, they eventually landed me in the cellar!

Looking for a Proper Notice

The injured man could live but a few moments.

"Tell them at home," he whispered, "that it was no common accident. Tell them that I was run over by an automobile, not by a trolley car."

Thus pride remained with him to the end.

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The King



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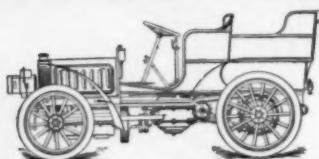
If you are having more than your share of motor troubles we can probably help you. Don't be bashful—send in your queries.

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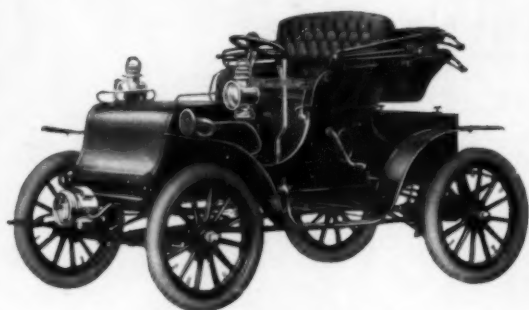
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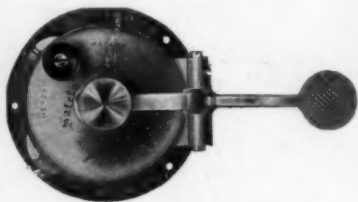
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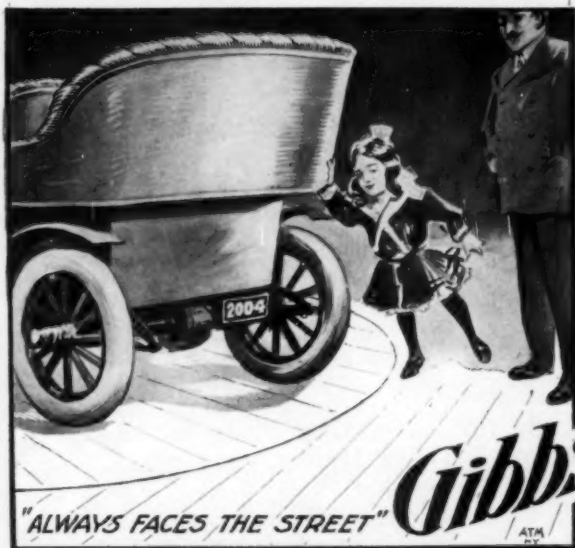
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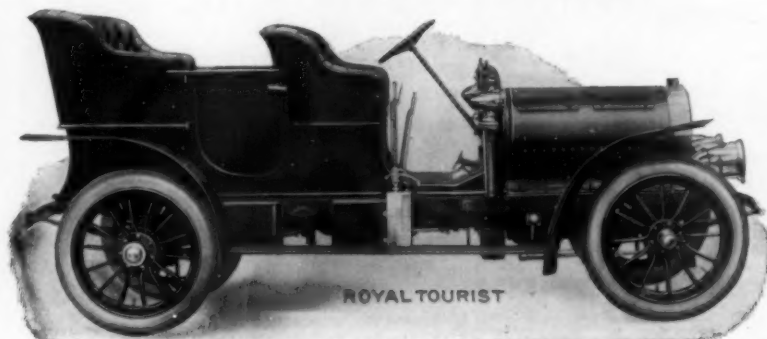
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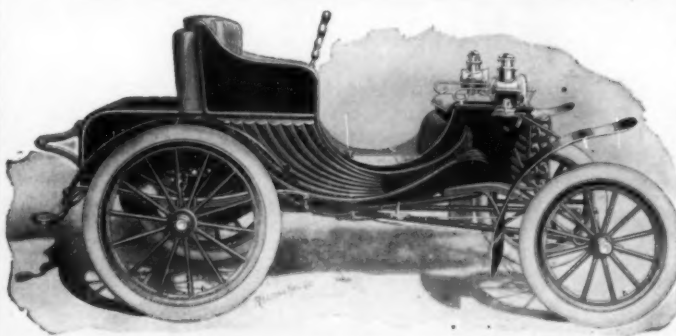
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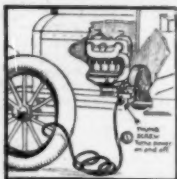
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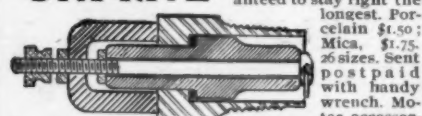
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The Automobile Magazine

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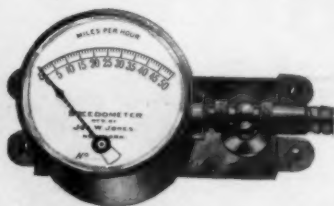
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Starting from Cold

The gasoline engine, like the steam engine, in fact, like all engines, is all the better for being run light for a few minutes before it is called upon to exert its full power. The motor should, therefore, be run for a couple of minutes before the car is required to start. A trained ear will always be able to detect if everything is running smoothly, at any rate as regards the engine, and will see that the cylinder walls have become lubricated, and the flow of the oil regular before demanding any hard work of the engine. Too often you see a driver start his car from cold, jump on to the seat at once, and be off up a steep hill without seeming to realize that the engine cannot develop its full power for some minutes after starting. Afterwards he will tell his friends that the engine wasn't working well and that "he couldn't make out what was the matter with her." For the first few minutes of running the power will gradually augment until the average maximum is arrived at.

Never forget that the exhaust gases from an explosive motor contain ingredients of a highly poisonous nature. Therefore when the engine is run indoors, always have a door or window wide open so as to ensure free ventilation.

Problems for Tire Makers

With all the many seeming impossibilities the tire makers have succeeded in accomplishing in their unceasing efforts to make the tiring of an automobile perfect, they have not yet succeeded in producing a really practicable and satisfactory unpuncturable and non-slipping tire. In the first place, most of the tire makers do not believe in the unpuncturable tire, because they argue that so long as a tire is constituted of compressed air, there is no satisfactory way

Susquehanna Silk Mills.

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MR

New York, June 26th, 1905.

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43 Warren St., New York City.**

Gentlemen:

By express prepaid I am returning to you to-day one of your shoes bought last year, and it affords me pleasure to give you the history of this shoe.

I put it on my heavy Winton 1904 Touring Car on June 28th, 1904. It was taken off on Dec. 1st, of the same year, as I laid off my car. It was put on again on April 30th, 1905, and I had it taken off to-day, not because I had a puncture or any other trouble, but because I think this shoe has done its duty.

In this time of seven months of continuous service, I have not had one puncture or any other trouble with this shoe, or inner tube, and it has not been touched.

My car makes between 1500 to 2000 miles a month, so that the mileage of this tire is between 10,500 and 14,000 miles. How much longer it would have lasted I cannot judge, but in order to avoid possible delay on the road, I prefer to put on a new outfit.

I hardly think this record of wearing can be beaten by any other tire, and I surely would not have any other but your make on my car.

Very truly yours,

Max Siemerman

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Both machines made fast time, one 22 min. 17 3/5 sec. and the other 30 min. 19 3/5 sec., consequently the tires were subjected to severe strain and were capable of standing it.

Yours truly,
STANLEY MOTOR CARRIAGE CO.
Per F. E. STANLEY.

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to prevent a tire from puncturing, except by entirely changing its nature. If two substances of different elasticities work together, the harder one ends by wearing away the softer, and the rubber very soon gives way to the hard puncture-proof material, with the result that it does not last any length of time. The only logical way of meeting the difficulty seems to exist in preventing the puncturing material from getting into the rubber, wherefor abroad they employ nail strippers, which clean the tire of all nails or sharp stones adhering to it, and reduce the risk of puncture by at least ninety per cent. As for non-slipping, the problem is an interesting one, but, unfortunately, the makers are again confronted with serious difficulties. Supposing a car weighing a ton were traveling at the modest speed of 25 miles an hour and suddenly it slipped sideways. If this side slip was to be prevented the tire would have to support the entire effort on a very small portion of its surface of contact with the soil. Consequently, if the tire were so made that it offered a resistance to the lateral slipping, it would simply be torn out of the rim.

It is advisable for the newly-fledged car owner to practice on the brake, and learn to estimate both distance and the speed of the car accurately before he attempts using it in crowded thoroughfares.

Putting a Motor Together

If necessity—and never let anything else tempt you—compels you to take your engine to pieces be very careful to get everything back in the correct place. You must be very well acquainted with an explosive motor to get the various parts of it back into their correct positions. The work should not be attempted unless it is known that all the parts are marked, for if the pinions of the

Refinement is the Aim of the Maker of Electric Carriages

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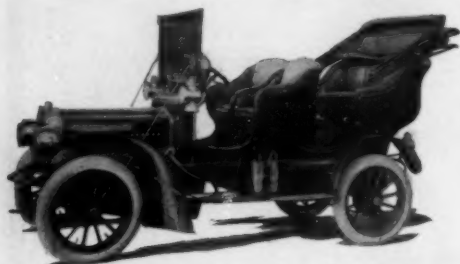
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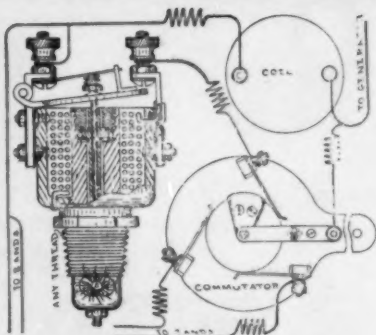
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30 C Street, Reading, Pa.

valve gear are only one tooth out the motor will not run, or, if it does, it will give practically no power.

Replacing Commutator Wires

In a four-cylinder engine there are, of course, four wires to the commutator; now four wires or four terminals can take up twenty-four different positions, and yet only one combination is correct, so it is as well to mark the wires when removing them, or better still to know how to replace them correctly, which in reality, is not a very difficult matter if you proceed along this fashion. Rotate the engine-shaft and note the order the exhaust valves close, so as to learn thereby the order of working of the four cylinders. Now start with No. 1 cylinder. Commence with the piston at the top (suction stroke), and turn engine shaft one revolution, put the commutator to late firing, and watch it carefully. It will be seen that one of the brushes is just on contact whereupon you know one wire is correctly affixed, and the rest are done in the same way. Of course No. 1 commutator wire is found by grounding the wires to the frame till No. 1 trembler vibrates.

After a car has been in continual use for some time, it is not a bad plan, if one has nothing else particular to do, to thoroughly overhaul the cooling system, wash out the watertank and the jackets, and thoroughly cleanse the pipes and coils by means of a hose. It is wonderful what a lot of dirt accumulates here after a spell of continual use.

Watered Gasolene Stock

The presence of water in gasolene is, to a certain extent, inevitable, and it becomes an ingredient of gasolene partly after it has left the refiners' hands. Thus the constant vaporization which goes on in the gasolene tank of a car (especially when the car is in motion) produces a



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American Motor League

IMPORTANT

The American Motor League is now collecting and compiling route information from all parts of the country, and will print Road Books for ten important States as soon as this information is completed. The League also proposes to establish a Route Information Bureau, from which information will be sent out to all inquiring automobilists by an expert employed for that purpose. The A. M. L. is the only organization which permits individual members (not members of clubs) to be represented by delegates at League meetings.

Recognized Automobile Clubs are received into the League on payment of a nominal fee only.

There is no initiation fee. The annual dues paid by each member is two dollars.

Full printed information relating to the League, and its object, will be sent on receipt of postal-card request.

American Motor League

Vanderbilt Building

New York City

lowering of temperature sufficient to cause condensation of aqueous vapor, which condenses and settles on the sides of the tank there forming drops which ultimately collect at the bottom of the tank and eventually find their way to the carbureter.

Look To Your Lubricators

The grease lubricators found on the dashboard of many cars are very often a delusion. These lubricators, by means of copper pipes of extremely limited cross-section, are supposed to distribute the grease to the various bearings, etc., the pressure being applied to the grease by a screw. This sounds well in theory; but, if the various little pipes are disconnected, it will often be found that grease is only going through about two of them, the others being empty. If the hitherto empty ones are started by means of temporarily stopping the others, but still fail to work satisfactorily, the only plan is to use thinner grease. It is well to note this, as damage has often been done through some parts being insufficiently lubricated.

Almost any cable will safely carry the low tension current, but no cable can be too well insulated or of too superior a quality to carry the high tension current to the sparking plug.

Study Auto Anatomy

The very first thing any man does when he buys an automobile should be the making of a study of the anatomy of the vehicle, since failing to do this means he will never become either an intelligent or a satisfied motorist. The comfort of knowing how to correct any of the minor causes of stoppage can only be estimated when you come to grief miles away from any one capable of doing the repairs or making the adjustments for you.

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WHITE
The Car for Service



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Use SOLAR
An illustrated
book giving
prices for the
asking.



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Valve Refusal to Set

Sometimes a motor will suddenly stop from the failure of the exhaust valve to seat properly. This failure to seat may be due to the warping of the valve through the engine having been permitted to run dry and as a result to become too hot, or it may come from the failure of the closing spring or the sticking of the valve stem in its guides. The valve should be removed, and the stem cleaned and scraped—or straightened if it requires it—until it moves freely in the guide and the closing spring given its full tension. If the valve still leaks so that the engine will not start or develop sufficient power, the valve will have to be ground into its seat.

Never run up to or near your stopping place at full speed and then put the brakes on hard, just to see how quickly you can stop. A motor car should always be stopped as gently as possible, and started in the same fashion.

The entire wiring of a car should be carefully examined from time to time for signs of wear in the insulation. At certain places the wires are exposed to continual, though slight, friction, which will ultimately break through the insulation and establish a short circuit. The timely application of a little insulating tape will often save much trouble in this respect. The heat of the exhaust pipe or muffler, for example, will melt the insulation of the high tension cable, if too close, and cause a defect.

He Didn't Want Much

There is a somewhat facetious cottage owner down on Long Island whose misfortune it is to have his domicile so situated at a sharp turn in the road that the house has a fatal fascination for scorchers who lose their heads and the control of their cars at one and the

Rambler



The hand that steers also controls the power

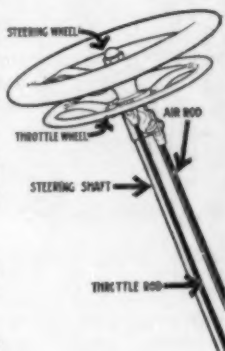
The Rambler throttle is opened or closed by the fingers of the hand that rests on the steering wheel.

Every forward movement of the car, from top speed to a complete stop, can be regulated by this means alone.

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same moment when seeking to make the turn. Quite a number of these Willie-boy chauffeurs have run into the cottage with more or less damage to themselves, their cars and the cottage. The property owner, utterly unmindful of the two first-named, has sought to protect the remaining one of the trio by placing across the front of the cottage in letters large enough for those who run (an automobile) to read this legend:

Automobilists will please leave this cottage where it is.

Always be on the look-out for "squeaks." Any such unusual noise is proof positive of lack of lubrication and almost invariably foretells a breakdown unless heeded at once.

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From the earliest times attempts to supplant the horse by adopting mechanical methods for traction purposes have been made. In the thirteenth century Roger Bacon wrote: "It is also possible to make cars operate with untold dispatch without the aid of beasts of burden." In 1649 the Nurembergian Jean Hautsch manufactured mechanical chariots which attained a speed of 2,000 kilos an hour. The most famous of these carriages was sold to Prince Charles-Gustave of Sweden for 500 rix dollars. Somewhat later, at Marly le Roi, the court of Louis XIV was amusing itself with the toy railway, manipulated by hand.

In the eighteenth century there appeared mechanical conveyances, similar in principle to the small invalid carriages which are now in use for helpless people. But by this time steam had been used as a motive power, and Newton had promulgated, in 1680, his project for applying steam derived from boiling water to land travel. As yet, however, the working plan was unsuccessful. Dr. Robinson (1759) and Erasmus Darwin

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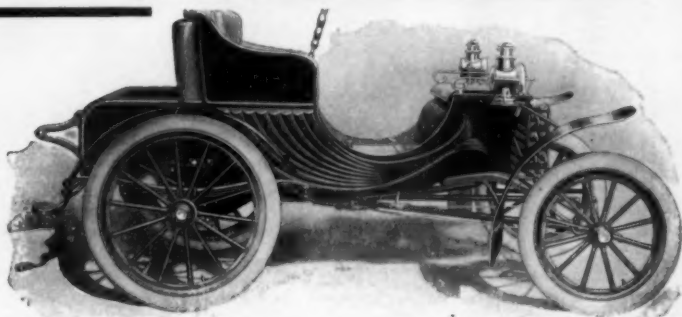
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(1765) failed equally in a similar attempt. This same year, 1765, is a celebrated one in the annals of the steam machine on account of the first essays of Cugnot, the French artillery officer, whose experiences are related by Bachumont in his memoirs, as follows:

"A singular machine has been recently experimented with; it is applied to carriages, and claims to cover space at the rate of two leagues an hour, no horse being attached to the vehicle; but the results have not been as promised—one-quarter of a league an hour being the most speed attained." The following year, however, results were more satisfactory, as is shown by the same writer on the date of Nov. 20, 1770:

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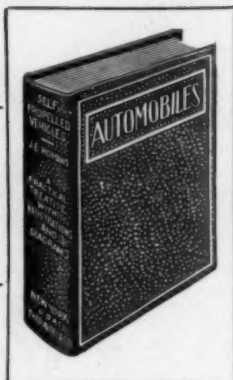
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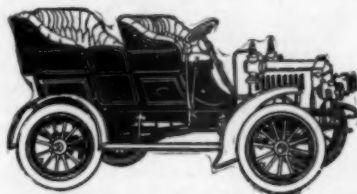
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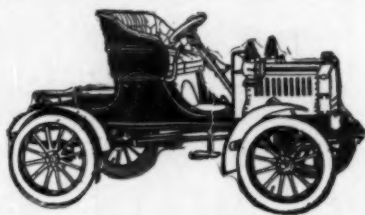
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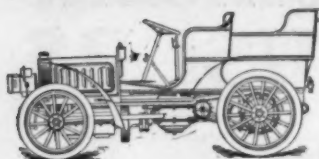
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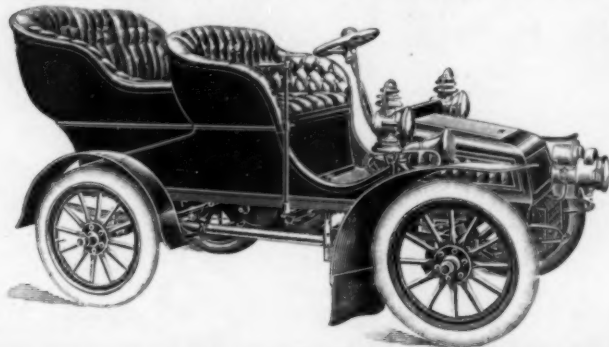
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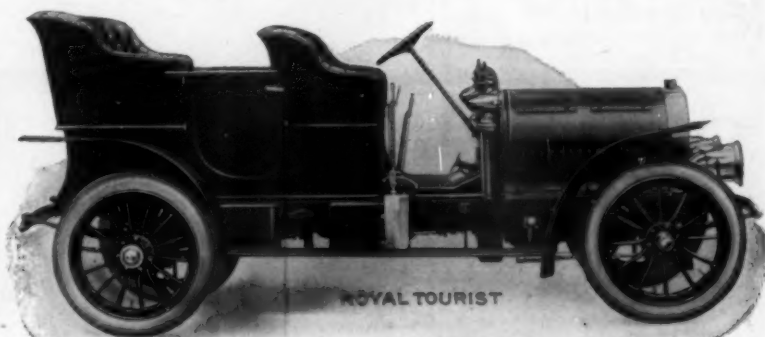
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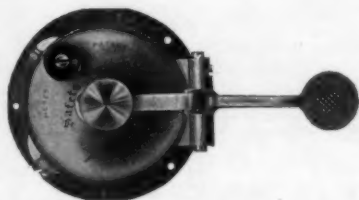
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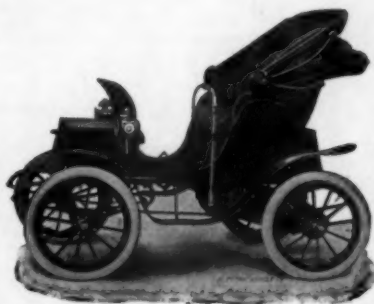
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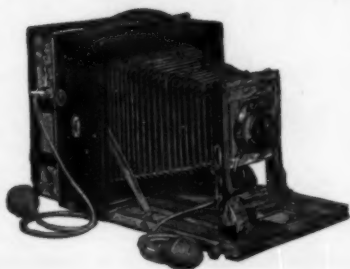
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The Automobile Magazine

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THE SPEEDOMETER



SPEEDOMETER Bulletin No. 2 contains speed notes and articles of interest to every driver of a motor car
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123 West 3rd St., New York

The "BARRETT" AUTOMOBILE JACKS

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THE DUFF MFG. CO.

Works, Allegheny, Pa.

PITTSBURG, PA.

Get Battery Wise Promptly

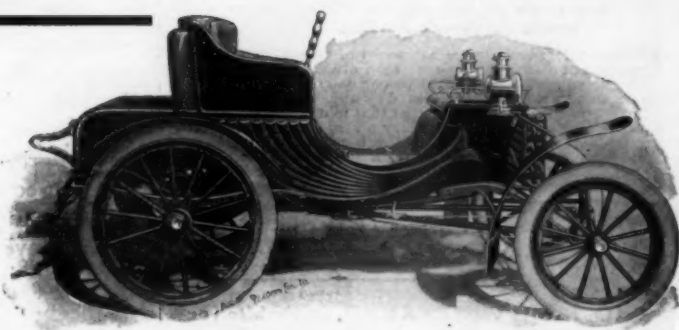
If the owner of an electric carriage would only learn a few simple things about the car's battery for example, never to run it down below 1.75 volts per cell of the lead type; to keep the cells clean and see that they are well washed at regular intervals; not to charge up too fast; to keep the electrolyte at the correct specific density and not to discharge too rapidly, the immediate result would be the pleasing discovery on his part that the modern battery can be safely relied upon to give splendid service and quite a wide range of operation. The last few years have marked two important developments in the storage battery, namely great reduction in the weight for the output and much greater durability and capacity for withstanding the abuse often given it by ignorant users, but there is still a lot left for the user to learn both for his sake and that of the battery as well.

Leaky threads in gasoline pipes may be made tight if covered with common soap or even white lead. If the water tanks develop cracks in the soldering and begin to leak excessively, caulking the crack with cloth, saturated with white lead, should be tried as a temporary repair.

Braking and Skidding

The question as to whether the tendency to side-slip in motor cars can be minimized by fitting brakes to the front wheels is one of great interest. While experience taught us that the rear wheel brake is the safest for a bicycle, as being less likely to disturb equilibrium, the same principle does not apply to the four-wheeled vehicle wherein the center of gravity cannot be so easily upset, and in which side-slip resolves itself into a swerving movement and loss of steering control. Braking the front wheels certainly minimizes the tendency of a car

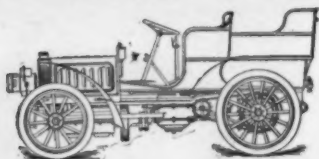
Three Cylinders Right



For eight seasons we have advocated TRIPLE cylinder motor. Panhard, the leading maker of France, and Napier, the leading maker of England, are putting them out for next year. If you want to be ahead of the game, buy a DURYEA. They always lead. ♣ ♣ ♣ ♣ ♣ Get our leaflets.

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Whittaker's Model of MOTOR CAR



WILL TELL YOU ALL ABOUT IT.

**The Model consists of Colored Charts
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in strong cardboard binding**

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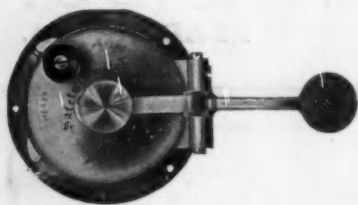
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**Herz's Patent Safety Switch and
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NEW YORK**

to swerve or side-slip. The reason for this, which has been proved by exhaustive experiments, and from which a new system for braking vehicles and railway carriages is being devised, is that when brake power is applied to a wheel the tendency is to cause the wheel to have less grip of the road or rail surface, and consequently when the brake power is applied to the back wheels their tendency then is to slide forward. When this occurs if the car is not in a perfectly straight line, it is inclined to slip sideways, not having the same amount of grip as the front wheels, which are unbraked. If the front wheels, however, are braked, these then have a less grip of the ground than the rear ones, and are consequently pushed forward. Relying on the correctness of this theory, brakes have lately been devised for railroad cars in which the brake power is automatically applied, so that the faster the speed the less pressure there is on the brakes, and as the cars are retarded the pressure increases.

A spare length of rubber tubing (preferably several lengths of various sizes) if carried on the car may prove very useful if the insulation of a wire should become damaged, or in case of a leak in a gasoline or water pipe.

Cleaning With Kerosene

If your car is going to remain in the garage or barn for a month or six weeks unused, it is an excellent plan to inject into the cylinder or cylinders, as the case may be, a small quantity of kerosene. It is obvious that what is good for one cylinder is, generally speaking, good for any number thereof, so that unless it is specifically stated that a certain thing is only good for a certain engine, the matter may always be broadly interpreted. However, to return to the question in hand, the reason for the use of kerosene is to clear the cylinder walls

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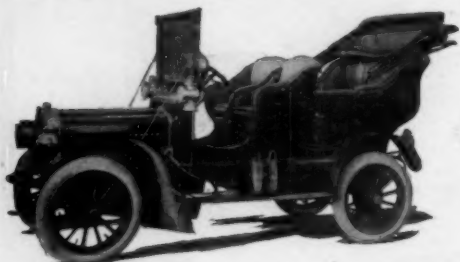
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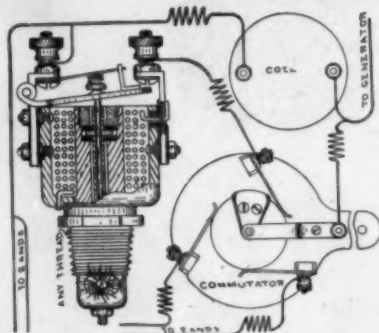


One of Col. Sprague's Cape Extension Tops closed down, leaving the glass front as a wind-break. The "Thomas Flyer" and many others will be equipped with these tops.

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If you are a sufferer, write us.

DURVEE POWER CO.
30 C Street, Reading, Pa.

of lubricating oils, which has a tendency to oxidize, and as a result of doing so to cause the piston to stick. Kerosene cleans the cylinder and piston, keeps the piston rings free, and still leaves a protecting coat of oil on the working parts. While the cylinders are being cleansed with kerosene injections, the waste oil drain tap in the crank-chamber should be opened, and the thick old oil permitted to run out. If this oil looks particularly dirty, it will do no harm to close the taps and put into the crank-chamber not less than a pint of kerosene. Give the starting handle a few vigorous turns, and then leave the engine for about ten minutes, at the end of which time open the drain taps again and you will see the good results of your labors in what will flow freely from the taps. After using kerosene in this fashion it is necessary to leave the drain taps open for at least twenty-four hours, in order to clean away all the kerosene possible, otherwise there will be no living in the vicinity of that engine for a brief period after starting it up.

Some second-hand-for-sale-cheap cars are like hobbyhorses—full of motion, but lacking in progress.

Braking for Safety

Neither too often, nor yet too emphatically, can it be repeated that there is an art in the application of brakes properly. Except in a sudden emergency, when it is essential to stop as quickly as possible, brakes should never be put on to their fullest extent. Not only does doing this cause an undue strain on the car and tires, but under certain circumstances it becomes distinctly dangerous. If, for example, the road is greasy and the brakes are jammed on, the car is sure to side-slip, and will, most likely, turn around. Should the pace be fast and the car in turning round strike the curbstone or other ob-



Gillette Safety Razor

There are several kinds of safety razors — the Gillette Safety Razor — and the other kinds. Most other safety razors have been on the market for years. The Gillette Safety Razor is a new idea, and is the **only** safety razor made on the right principle, insuring a clean, sure, easy, and comfortable shave to the man who uses it.

One of the indisputable proofs of its success is that **hundreds of thousands are now in use**. Every one sold and used means a happy, satisfied customer, ever ready to sing its praise. Every Gillette Razor sold (and every day shows a steady increase in sales) proves that the man who buys a Gillette is not satisfied with the other kind or with the other method.

For comfort, health, and economy's sake shave yourself the Gillette way. Once that way, never again the other.

The price of the Gillette Safety Razor is **\$5.00** complete in an attractive, compact, velvet-lined case. The Razor is **triple silver-plated**; has **12 thin, flexible, highly tempered** and keen double-edged blades. These blades are sharpened and ground by a secret process and **require no honing or stropping**.

Each blade will give from twenty to forty smooth and delightful shaves. You therefore have by using a Gillette Safety Razor **400 shaves without stropping**, at less than 1 cent a shave.

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Write to-day for our interesting booklet which explains our 30-day free trial offer. Most dealers make this offer; if yours does not, we will.

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THE Protection Disk

is shown (both sides) on this page. It is attached to cars belonging to A. M. L. members. It is covered with red leather, with gold letters; will not tarnish easily by exposure of the weather, and will not scratch or mar the polished surface of the vehicle.

The A. M. L. invites to its ranks all automobilists of good character. For full information address

American Motor League
Vanderbilt Building, New York, N. Y.



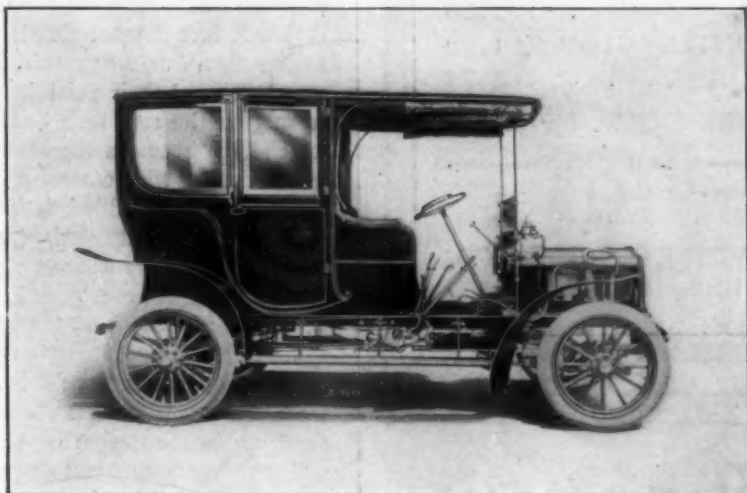
struction, it is probable that it will upset. Even when it is necessary to stop in the shortest possible time to avoid a collision or catastrophe on the road, the brakes should not be jammed on to their fullest extent at the first effort, for this will lock the wheels, causing them to slide while the car will not stop as quickly as it would if the application of the brake was more gradual. Proper braking is a most difficult art to acquire, because when the emergency demanding it arises, one's whole attention is naturally focused on applying the brakes as effectively as possible, irrespective of the strain on the car, while the gradations required between the first application of the brake and when the final power is applied after the car has traversed two or three yards is so subtle and requires such delicacy of touch that it is only to be acquired by practice. This delicacy of touch is particularly necessary on slippery roads, because there, above all places, the application of the brake must be so gradual that the friction between the driving wheels and the ground will not be reduced to a negligible quantity, and the driver has to learn by practical experience exactly what extent of braking his car will stand under such circumstances. It must be borne in mind that when the emergency arises there is no time for thought. The action must be instinctive, and, therefore, to be successful it must come from experience.

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A prolific cause of excessive tire wear and one seldom thought of by the manufacturer and virtually never even dreamed of by the user, is the great strain put upon tires by improperly calculated steering angles in the design of the car's steering knuckles and gear.

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The quality of absolute noiselessness of operation is particularly desirable in a limousine because, in any car with a closed body, the noise made by the mechanism is much more noticeable and annoying than in an open vehicle.

Another desirable feature of a limousine is that its speed responds instantly to the throttle, in order that it may be guided safely and speedily through the crowded city streets.

Both these qualities (inherent in the use of steam power) the **WHITE** limousine possesses in unique degree. As regards the graceful lines and luxuriousness of equipment and finish, the **WHITE** limousine must be seen to be appreciated.

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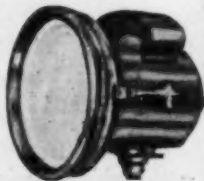
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SOLAR MOTOR LAMPS

THERE'S worse than speed laws for the man who likes to go fast at night. There's dubious lamps.

Moral—
Use SOLAR

An illustrated
book giving
prices for the
asking.



Badger Brass Mfg. Co.
KENOSHA, WIS.
NEW YORK OFFICE, 11 WARREN STREET

Many car owners must have noted the excessive tire wear which almost invariably follows any accident to the front axle and steering arrangement, but seldom have the sufferers understood why the tires wore out so quickly. It is absolutely necessary in an automobile that both steering axles should turn on radii from a common center with suitable means for varying the angles of the two from the transverse axle. This common mechanical but imperfectly understood fact is most clearly stated by saying that, however much the wheels may be turned their axial lines must intersect on the rear axle line produced, which thus becomes the center around which the car will rotate. If these conditions are not fulfilled, it matters not whether from faulty designing or accident, excessive tire wear at once occurs. The problem was recognized and solved years ago in Europe on the early steam vehicles, but it is not always as carefully followed out as it should be. As the wear and tear of tires is always with us anything in the design of a car which will even in the slightest degree tend to mitigate the evil is of very vital importance.

There are always two ways to do anything about a car, and it's invariably a short cut to the wrong way.

Where the Electric is Supreme

One thing in an electrically propelled carriage which instantly appeals to the engineer, while perhaps it is never thought of by the layman, is that this carriage's rotary motor is subject to far less wear than a reciprocating motor such as is used in a steam or gasoline-powered car. It is this feature of the electric motor, rotary motion, without any connecting rods or crank shafts, with powerful starting effort under a load, that made it an ideal source of power to attach to a wheel, the motion

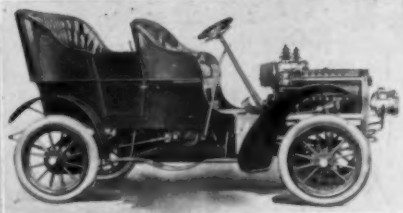
Rambler



Easiest to Operate —Safest to Drive

There is no complicated system of levers on the Rambler. Every part is as simple as the Rambler control, here shown.

Below the steering wheel on the Rambler is the throttle, which can be tilted by the fingers to increase or decrease the speed of the car at will.



Surrey, Type One, \$1,350.00 Other models,
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Every forward movement of the car, from highest speed to full stop, can be controlled without moving the hand from the steering wheel.

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Lake Erie
Between
Twilight
and
Dawn

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Detroit & Buffalo Steamboat Co.

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Detroit, Mich.

of which has to be rotary. This is exactly the reason why the electric motor has conquered the domain of the street car completely and is being fitted to all kinds of rotary machinery to-day. The electric motor has no tendency, therefore, to pound itself to pieces and is especially adapted in consequence to receive and withstand the shock and jars of ordinary road travel, such as every automobile is called upon to withstand. When added to this the engineer sees that all speeds can be economically obtained, without change gears, by simply altering the connections of field coils and batteries by a simple contact controller and reversing accomplished almost instantly whenever desired in the simplest manner, he is inclined to look very favorably upon the electric vehicle's claims for a prominent place in that portion of the field of mechanical traction devoted to the automobile.

The proper horse power rating of gasoline motors is a hard matter to agree upon. For example, a 4 inch by 4 inch motor running at 600 revolutions on a compression of 45 pounds will only give about $2\frac{1}{2}$ horse power on the brake, while at 1,800-2,000 revolutions the same motor will come mighty close to developing 8 horse power.

What Rims Do to Tires

Most men are inclined to be careless in regard to the rim to which the tire covers are attached, with the very natural result that it often happens after running on a deflated cover, or as the result of any slight accident, that the rim gets knocked slightly out of shape, causing the edge thereof to have a certain cutting action on the beaded edge of the cover. Rims, therefore, should be examined from time to time by jacking up the car and turning the wheel round, making a close inspection of the edge of the rim in which the cover fits.

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Sole Importer
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By this means the slightest dent or malformation of the rim is immediately detected, and can be easily remedied in the following manner: If the edge has been knocked down or flattened, it is rather difficult for an amateur to satisfactorily repair it himself, though usually a competent blacksmith can put it right, with the aid of a pair of tongs. When, however, the damage arise from slight bulges, they can be removed by means of a small hammer carefully used in order to prevent denting in the rim. It must not be overlooked that these little attentions will remove the paint from the rim, and it is therefore necessary afterwards to give the parts operated upon two or three coats of paint and varnish, since an unpainted or badly painted rim will soon rust, and a rusty rim will spoil more covers than you will ever want to pay for. Frequent examination of the state of the edge of the rims is a necessity, if you wish to keep tires in good condition, and secure long life and durability of the covers thereof.

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WE DO not claim to know it all, but what we don't know we can find out for you—perhaps better than you can for yourself.

If you are having more than your share of motor troubles we can probably help you. Don't be bashful—send in your queries.

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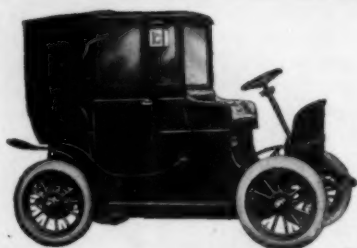
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Good as rolling contact commutators undoubtedly are, yet, nevertheless, trouble may arise from them and within them which the ordinary user of them may be long in diagnosing if he has not been forewarned that its happening is within the bounds of possibility. After considerable use the friction of the roller over the metal contacts flush with the surface of the fiber ring within which the grounding roller ended lever on the end of the commutator shaft rotates has the effect of wearing off small particles of the metal and gradually laying these in the form of an embedded train, which will ultimately connect one contact with the other, so that the current will short circuit all round, and whether two or four cylinders are served, current will pass to all the sparking plugs at once. If this has happened, the only thing to do is to detach the fiber ring and scrape the inlaid metal from its surface. In order to prevent any need for doing anything of this kind as far as possible, commutators of rolling contact type should be kept well lubricated with clean oil, and washed out from time to time with gasolene sprayed in. The above advice applies with even more force to the commutators made on similar lines, but which have a rubbing in lieu of a rolling contact.

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"Is it true that your chauffeur eloped with your wife?"

"Yes, but that's all right! I was going to discharge him at the end of the month, anyway!"

Testing Acid Gravity

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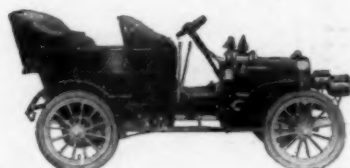
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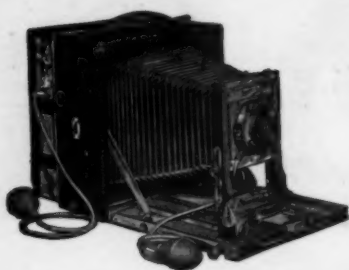
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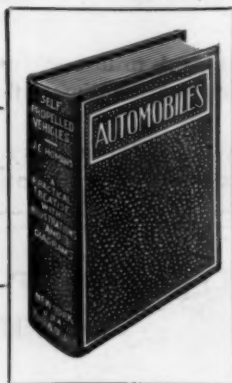
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dex. If when tested the acid shows a low specific gravity, a little more acid should be added to the cells until the hydrometer shows 1.190 on the index, being level with the surface of the acid. When it becomes necessary to add some acid to the cells, that known as brimstone sulphuric should be used. It is well to note that when making up new solution to replace that which has been in the cells for some time, distilled or clean rain water only should be used, and that the acid should be added to the water. In making up new solution it should be done in a clean glass jar and the acid added little by little to prevent overheating. The solution should only be tested when cool. The approximate proportions of acid to water are one to four.

Making It Strong

The Promoter—My dear sir, subscribing to stock in this automobile factory which I am seeking to have located right here in Jayville is the opportunity of a lifetime, an absolutely safe, 20 per cent. investment; it's a cinch—it's—it's — Why, hang it, I'm thinking seriously of taking stock in it myself!

Safety in Gasolene Storage

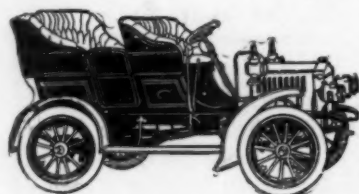
While underground gasolene storage tanks have proven their right to be termed fireproof, care should be taken that no surface storage tanks are used. Garages have been visited where there was a good underground tank system, but also where a surface tank was used. The foolishness of the latter spoils the wisdom of the former. The strength of a chain is the staunchness of its weakest link, and the safety of a gasolene storage system consists in the fireproofness of its most exposed part. In many garages where the drip pan is not used small pools of gasolene are often to be seen upon the floor as the result of a leaky tank or carbureter. The use of

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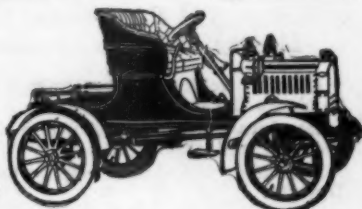
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drip pans will offer a measure of safety and will prevent the soaking of oils and gasoline into the floor. Where the pump from the storage tank is, there is often sufficient gasoline wasted to prove dangerous if a fire should start. The most modern storage pumps have drip funnels that catch the overflow liquid, and it would be a commendable protection to have the entire pump enclosed in an iron or steel case so that no possible danger would exist.

A Magnate

"Is he very rich?"

"Rich? Why, he's so rich he daren't take a girl out twice in that big car of his for fear she'll bring a breach of promise suit."

First Aid to the Injured Tire

The question as to just when a tire needs repairing is one of sympathetic judgment. We have seen men running tires upon the treads of which there was scarcely an ounce of rubber left, and yet the owners of the tires talked of having them retreaded when the rubber was all gone. Directly a bad cut in the cover is observed, a rule should be made of having it attended to at the first opportunity. The cut should be washed out with water to remove dirt, and then carefully dried. Gasolene should then be wiped or brushed into the cut to further clean the surfaces and prepare them for the coating of rubber solution, which should be next applied. After the solution has been left for about ten minutes or a little more, the cut may be filled up with one of the many preparations which are to be had for the purpose. Failure in a tire repair is almost invariably traceable to insufficient cleansing or experimental treatment. Any cuts which are found in the covers should be dealt with on the lines indicated above. If you have the suspicion that any particular tire is



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CLYDE, OHIO

The Battle of the Tires

In automobilistic conversation or literature reference to the pneumatic tire recurs as frequently as does "The Last Rose of Summer" in the opera of "Martha."

There is an excellent reason for this. The tires are an essential feature of the automobile's economy. Although a marvelous creation of engineering skill, the automobile only became a practical reality when the pneumatic tire was invented. Without this device to absorb the shock caused by uneven road surface speeds of more than twenty-five kilometers an hour would be destructive to the machine and torture to the passengers. Thus far no effective substitute for the "pneu" has been discovered, although there's no end to the efforts to find one. The latest candidate is Mr. J. C. Rutherford's iron tire, recently described in our columns.

In appearance it must be admitted this new tire seems better adapted to the ox chariot of a Merovingian king than for use in connection with an automobile of the twentieth century. That detail alone may prevent it from replacing the pneumatic tire in public favor. Certainly it would be difficult to devise a tire that in efficaciousness, relative durability and symmetry could compete successfully with the Continental. The quality of wares turned out by the famous Continental Co. has just been subjected to a searching test in the Paris-Trouville and Paris-Dieppe delivery services organized by our European edition, details of which have been related by cable in our columns. So far as the *Herald's* experiences go in this battle of the tires the honors are even. The Continental has won fresh laurels in this daily run against time from Paris to the sea.

The triumph is no empty one, for the strain imposed has been exceptionally severe and the result correspondingly conclusive. It is probable that automobile construction will derive more benefit from such a trial of endurance than from any amount of racing for international cups. One may reasonably question, in fact, whether practical good is ever achieved from the development of anything for purely sporting purposes. A race horse is virtually useless except for racing. The type of yacht developed in this country by the contests for the America's Cup has no value except as a racing machine, whereas seaworthy vessels with some provision for comfort are essential. Similarly, in automobilism speed races are probably less favorable to the evolution of a practical type of machine than are endurance trials such as those presented in the European edition of the *Herald's* daily service from Paris to the French watering places.

"It's not the 'unting that 'urts the 'orse; it's the 'ammer, 'ammer, 'ammer on the 'ard 'ighway." And "it's the 'ammer, 'ammer, 'ammer on the 'ard 'ighway," day after day, in every kind of weather—good, bad or indifferent—that reveals the defective features in an automobile.—Editorial, *New York Herald*, Aug. 29, 1905.

in such condition that it may at any time become a "lame duck," have it off; it saves hours (possibly on the roadside) at a later date.

Explanatory of His Hard Luck

"Why," said the man who always asked questions before he gave up, "is a husky looking chap like you begging? Have you no trade?"

"I uster ter be a hossthief, boss," said the would-be recipient of bounty, "but de invenshun of de autermobeel broke up me biz'ness an' put me on de bum."

"How did that happen?"

"I uster ter be a hossthief, boss, but since people took ter autermobeels dey ain't no demand for hosses no more. Can't youse make it er dime, jist ter help a hard-luck victim erlong?"

Preventing and Curing Burns

Most owners have suffered at one time or another from burnt fingers after some necessary adjustment to a hot motor. A good way of minimizing the chance of experiencing this proof of the presence of heat is to cover the exhaust and water pipes, in such places where the hand or arm may touch them when groping after valve-springs, lifters, and the like, with a lagging of asbestos. This may be easily applied by wetting a strip of asbestos card, cut to suitable size, and coiling it round the pipe; when dry, it will adhere sufficiently. Of course, it is inadvisable to cover the pipe more than is absolutely necessary. While on the subject of burns it may be well to mention a valuable remedy, perhaps not universally familiar, namely, a strong aqueous solution of picric acid. This at once removes pain and to a great extent prevents blisters, at the expense merely of dyeing the affected part, for several days, of a color that will probably match the wheels of the car, but that is a very small matter where the stopping of the pain is the first essential.

Talk is Cheap

but facts are what count in the automobile business. Many customers are prone to buy a locomotive because some of their wealthier friends have one, and then kick on account of repair bills. There is a happy medium to be had by owners, and when you avoid the cheap runabouts, don't make the mistake of paying three or four prices for complicated power which you can never use. Unnecessary mechanism is

a problem half finished, while simplicity is the work of a true genius. The now often heard phrase (made good) was coined by satisfied users of ST. LOUIS cars. Remember this when placing your order. *Catalogs free.*



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To Save the Spark Plug

Upon a spark plug manifesting a tendency to stick and give trouble when it is necessary to remove it, it often pays to coat the threads before putting the plug back with a paste consisting of any good grease into which has been worked as much graphite as it will hold. The grease, which is simply a vehicle for the graphite, runs away as soon as the engine is hot, but the latter remains, and serves as a lubricant when the plug is to be unscrewed. It is well also to remember when putting a plug into a hot engine that it must not be screwed in too tightly, or later on when it has set after becoming cold it cannot be easily removed.

Oil That Cold Will Not Affect

It is often difficult to keep machinery properly oiled in cold weather, as the oil freezes in the oil holes and the cups. A good oil for winter use is made by mixing graphite with cylinder oil until it becomes of thick or pasty consistency, and then adding kerosene until it flows freely. This oil will not become stiff at 14 degrees below zero, and is valuable to those operating machinery in low temperatures.

Not Always a Puncture

Not infrequently it happens that a false alarm of puncture is raised through a tire suddenly becoming deflated. It is well, therefore, always to make sure that this is due to a puncture before commencing to detach the cover, as often it will be only the valve which is at fault. This is particularly the case when a tire has gone down gradually, and not with the sudden hiss that betokens the incursion of some intruding substance. It is decidedly aggravating, after you have taken the trouble to open a tire in search for a supposed puncture, to find that both cover and tube are sound, and that the deflation was caused solely

Touring Department

THE AUTOMOBILE MAGAZINE has a Touring Department in charge of an expert who goes personally over the routes he advises you to take. No matter what you want to learn about Routes, Roads, Equipment, etc., you can be sure of getting it right when you address an inquiry to the

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by valve failure. During a recent tour an obstinate case of leaky valve which caused a tire to deflate slowly was overcome by adopting the expedient of buying some common putty and completely encasing the valve in a jacket of it, around which was bandaged some rags to hold the putty on. By this means the leakage was prevented and the tire reached home perfectly inflated.

Figuring on the Run

"I've got a new car," said the touring man,

"And I don't think I've chosen the wrong one ;

"And if all should go right with my newly made plan,

"I expect to succeed in the 'long run.'"

Getting the Clutch in Properly

Often when a driver has run up to, and come to a rest at, a point at which he desires to stop on top speed, some difficulty will be experienced in returning the change speed lever to the neutral notch in the quadrant. This is due to the fact that the teeth of the toothed wheels on the sliding sleeve on the clutch shaft do not at the moment exactly coincide with the spaces between the toothed wheels on the gear-shaft, and the wheels will not pass each other. Of course, the clutch can be let in slightly, which would alter their position with regard to each other, but not infrequently the teeth still foul. The depression of the brake pedal, however, and the consequent grip of the brake bands on the drum, will, permitted by the slight play in the driving shaft, cause the gear-shaft to move just enough to permit the passage of the wheels on the sliding sleeve through their fellows, and allow the neutral notch to be at once attained.

Trouble is like money. It is better to save it than to borrow it.

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Taking Out a Spark Plug

When sparking plugs are located in the cylinder in such a way that it is necessary, in order to remove them, to use a "box" or "socket" wrench, care must be taken that the wrench does not come in contact with the metal tip on the end of the porcelain, because if it presses against this tip or against the porcelain even lightly it is almost sure to crack the latter. For the same reason it is well to remove the thumb nut or screw which fastens the wire to the plug terminal. On some kinds of plugs the nut or screw is so large that it is almost impossible to put a box spanner on the plug without cramping the nut, and so cracking the porcelain. When connecting the wire to the plug, this screw or nut should be tightened up with the fingers, as, if pliers are used, the central wire which goes through the porcelain is likely to be twisted and loosened. On other types of plugs the binding screws are slotted so that a screwdriver can be used to tighten or loosen the screws. With these the screwdriver used should be a small one and handled with care.

Making a Temporary Washer

Often on the road it is found that a loss of compression is taking place past the copper washer beneath the spark plug flange, and about the same time it is discovered that a spare washer is not available. An excellent substitute for the missing washer can be made by cutting a piece of 1/16 in. copper wire the right length and bending it round circularly so that the ends overlap. Heat the copper and plunge it into water to soften it, and then give each of the overlapping ends a tap with a hammer to reduce the thickness to about one-half, and so that they fit together fairly well. On screwing this ring up tightly it will be found that this will make a first-class joint.

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Putting Lamps Away Correctly

In laying a car up for any time, lamps, whether of the oil or acetylene type, should be thoroughly cleaned and polished, then wrapped in cloths, and stored in a dry place. Particular care should be taken to thoroughly cleanse the carbide container of acetylene lamps of all deposit, and carefully dry the interior of the vessel before putting it away, since if any carbide is allowed to remain in the container for any length of time it will form such a hard and solid mass as to endanger the container when it is removed by forcible means at a later stage. All oil and wicks should be removed from the wells of oil lamps, and as a further precaution against the action of stale oil at a later period, the wells should be washed with a strong solution of hot soda and water, afterwards being carefully wiped out, or, if a cloth cannot be inserted into the oil well, they should be dried by evaporation.

Rain, or boiled or distilled water, is better than ordinary water for use in the circulation system of a car. When clean rain water is used there is very little foreign matter in it which tends to fur up the cooling tubes, and its use is therefore always to be commended.

Carriage of Spare Tires

Most car owners when starting on a long tour or drive provide themselves with a spare tire cover and air tube. The chief trouble in connection with doing this is that there is no suitable place provided for carrying them on the majority of cars. Most owners, for want of a better place, fasten the spare tires on the back of the car, and in many cases put a spare air tube inside the cover, partially inflated, thinking they could not have a better place in which to keep it until it is required for the purpose of repair or replacement. In reality, no place could be worse for car-



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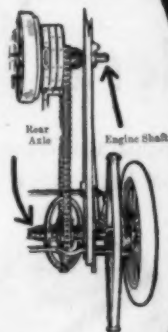
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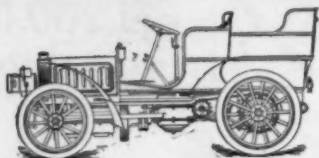
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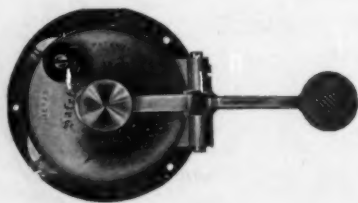
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rying an air tube than inside a cover, where it is, especially when fastened at the rear of the car, subject to all the dust and dirt thrown up by the rear wheels. This dust, laden with its small particles of grit, is carried inside the cover. Then the particles at the bottom between the air tube and the cover act like a rough file on the surface of the air tube, the vibration of the car rubbing the surfaces of tube and cover together with the dust acting like emery paper between them. Air tubes should not be carried in this way. They should be folded up, and the valve wrapped up in cloth and placed in a special bag well dusted out with French chalk. Where the type of body permits, a drawer or false floor should be provided beneath the rear floor boards in which a spare tire may be carried in safety.

To make sure of always getting a good light from an acetylene lamp, it is important to keep the burner clean. This can very easily be done by dipping the burner in liquor postassæ. The burner should then be washed in alcohol or gasolene.

Covering a Car Properly

Even in the very best of garages, it is well to entirely cover a car, including the bonnet, with a light sheet, the edges of which are provided with tapes to enable it to be tied down into position over the car. Where the cars are provided with hoods or canopies they present considerable difficulty in properly covering them, owing to the immense size of the sheet which has to be used to cover them entirely. In fact for the really efficient protection of such cars as are so fitted, two sheets would be necessary, one of which would cover the body completely, slots being cut in the edges of this sheet at suitable points so that the rods supporting the canopy would not

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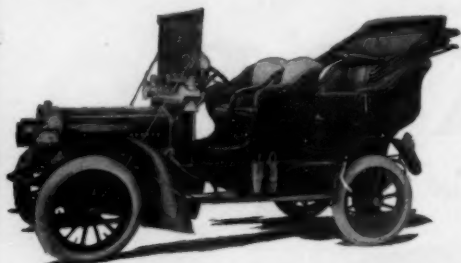
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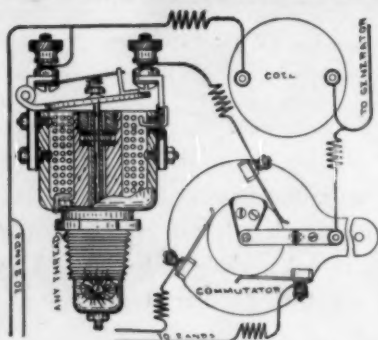
interfere with the complete protection of the carriage body. If it is thought absolutely necessary to protect the canopy by reason of its being fitted with expensive curtains, a second sheet should be thrown over it and allowed to hang down far enough to overlap the sheet which is placed over the car. Leather hoods should not be allowed to remain folded up for any long period, since no matter how good the leather in them may be, since no matter what means are taken to provide for the protection and the retention of its suppleness, the leather will dry and crack where sharp bends occur in it. For this reason, it is well, if possible, to let the hood remain open during such time as the car is standing in the garage.

The diameter of valves exercises a great deal of influence in the running and power developed by an engine. Too small valves throttle the inlet and exhaust, and slow up the engine, in addition to causing much overheating.

Chains and Their Changing

Chains are now obtainable of such strength and durability that, so far as their life is concerned, they leave little to be desired. As this method of transmission is so frequently preferred to that of the live axle for the majority of cars of the heavier class, it is reasonable to ask whether: some of the obvious disadvantages begotten of chain drive could not be easily eliminated. Some means of adjusting the distance between sprockets and driving wheels is invariably provided, but it frequently happens that the limit of the adjustment is reached long before the chains are worn to a degree rendering their replacement by new chains advisable. Or again, a change of gear by substituting different sprockets (one of the great advantages of the chain drive) frequently leaves the chain either too

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long or too short by a link or more, apart from the range of adjustment available. The removal or addition of a link in a driving chain is an undertaking requiring a certain degree of skill, apart from the question of time, in the case of the majority of chains, which are built up of specially tempered materials. It seems desirable, therefore, that provision should be made in all chains for one, two, or more links to be easily removable at will, as a ready means of providing a welcome solution of one of the lesser difficulties almost all automobilists are certain sooner or later to encounter.

It is not often that a piston cracks, but it has happened and will do so again, therefore, should want of compression occur, and all the valves, etc., are perfect, remove the cylinder. Then scrape the deposit off the top of the piston, and a crack may be found, the mystery being at once explained.

Sparks to Correspond With Cylinders

Entirely too many people are of the erroneous opinion that provided the coil produces a spark, that is sufficient. Possessors of this opinion have obviously not reflected on the matter. The strength of the spark that you get from the coil depends upon the cubic capacity and the pressure in the cylinder. With a coil giving a small spark, you may get good results in small cylinders and less satisfactory results in big cylinders—that is to say, an efficiency which will not be the maximum. The object in producing a spark is to fire an explosive mixture in the shortest time, so as to get the maximum combustion and the most rapid propagation of the flame. To get this result you must proportion the spark to the cylinder, for if you compare the spark with a sphere you will at once see that the surface of the spark which produces the firing varies accord-

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ing to the cube of the radius, so that if you increase the spark you vary largely the propagation of the flame, which is proportional to the initial firing surface. At the same time, you must not always be satisfied with having an extra rapid trembler; you must use a trembler suitable for the maximum speed of the motor. With the same expenditure of current a rapid trembler produces smaller sparks in the secondary than low-speed tremblers; therefore you get a less good effect from its rapidity. To use a trembler suitable for a motor running at 1,800 revolutions on a motor running at 1,000 to 1,200, is to cause your motor to do neither itself, its maker nor its user justice.

It is really surprising how much use can be made of strong wire in temporary repair work when ingenuity is used. A cracked pipe which has begun to leak badly may be rendered tight enough to be usable, if tightly wound with adhesive tape and then with fine wire.

Setting Valves and Lifts

Valve setting is not the easiest thing there is in connection with an automobile and should not, therefore, be undertaken by the ordinary amateur unless it be a case of where "one needs must when the devil drives." When this unfortunate condition arises here is the shortest and the surest way of doing the job: Turn the crankshaft until the piston reaches the top point of its stroke, then put the camshaft gear wheel in mesh with its driving wheel in such a position that the exhaust valve tappet just allows the exhaust valve to close fairly down on its seating. Mark the position of the wheels where they mesh by center dotting a tooth and its corresponding space on the other meshing wheel. Then fit the exhaust cam so that it starts to open the exhaust valve when the piston is about one-eighth inch away

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We are constantly offered machines of almost all the popular makes, such as Stevens-Duryea, White, Knox, Pierce, Winton, Queen, Olds, Orient Buckboard, Franklin, etc., on which we can make very attractive prices. DO NOT confuse these cars with the USUAL second-hand car. They are in fair condition or we will not take them in exchange for the more powerful DURYEAS. We do not simply varnish these cars, as do some dealers. We have a complete auto factory in which practically every part of the DURYEA is made. All second-hand machines, before being delivered, are taken completely apart; any parts which are in bad shape are replaced by new ones, so that the machine you buy is almost as good as a new one—sometimes better. If you want an auto write us at once, as at the prices we are quoting they will go quickly.

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THE D. & B. Line Steamers Leave Detroit daily at 5.00 p.m. (central time) and Buffalo daily at 5.30 p.m. (eastern time) reaching their destination the next morning after a cool, comfortable night's rest en route. By special arrangement all classes of tickets reading via the Michigan Central, Wabash and Grand Trunk Railways, between Detroit and Buffalo, in either direction, are optional and will be accepted for transportation on the D & B. Line.

Detroit & Buffalo Steamboat Co.

A. A. SCHANTZ, Gen'l Supt. & Pass. Traf. Mgr.
Detroit, Mich.

from the bottom of its stroke, when the crankshaft is rotated, and the suction, compression and part of the working stroke have been passed through by the piston. The inlet valve cam must be set so that it commences to lift the inlet valve just at the moment the exhaust valve has reached its seating at the end of the exhaust stroke. It should close at the end of the suction stroke the moment the piston is moving upward on its compression stroke.

Trap Wires at Terminals

The connections of the ignition wires to terminals should be wrapped round with rubber tape, and a little solution, such as used for mending tires, can be added with advantage. This wrapping up of cable ends and connections, while keeping moisture and wet from entering along and down the insulation, also prevents the nuts securing the cable ends from working loose and getting lost, since they cannot turn when wrapped with the tape.

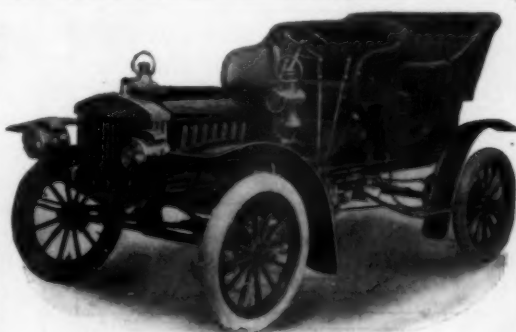
Lining Up a Clutch

To line up the clutch the engine must be first placed in position in the frame so that the height of the center, i. e., the level of the crankshaft center, is level with the gear box center. To be certain of doing this try a straight edge or tightly stretched string along the center of the crank case and the gear box, and if necessary place packing, strips of paper, tin, or other suitable material under the engine supports if the engine is lowest, or drop the engine to suit the gear box by removing a little of the metal from the engine supports if the engine is the highest. When the line exactly coincides along the engine and gear box centers, then the clutch should be tried for side alignment by placing a straight edge on the back of the male part of the clutch and then seeing whether the face of the

Talk is Cheap

but facts are what count in the automobile business. Many customers are prone to buy a locomotive because some of their wealthier friends have one, and then kick on account of repair bills. There is a happy medium to be had by owners, and when you avoid the cheap runabouts, don't make the mistake of paying three or four prices for complicated power which you can never use. Unnecessary mechanism is

a problem half finished, while simplicity is the work of a true genius. The now often heard phrase (made good) was coined by satisfied users of ST. LOUIS cars. Remember this when placing your order. *Catalogs free.*



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Cleans thoroughly and restores the lustre without affecting the varnish. It is without doubt the best automobile cleaner on the market. Sample and directions furnished on application. Price per gallon, \$1.00, f. o. b. Chester; packed in tin, wooden covered cans

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Special Announcement

AN INVITATION is extended by the management of the HOTEL GALLATIN to any white merchant or his representative outside of New York City, whose name appears in Bradstreet's or Dun's Commercial Agency Book, to accept the hospitality of the Gallatin Hotel, 70 West 46th Street, for three days without charge. Usual rates, apartment with private bath, \$3.00 per day and up, without meals. Parlor, bedroom and private bath, \$35.00 per week and up, with meals for two : : :

GALLATIN HOTEL
70 W. 46th St., New York City

female is parallel with it in all directions. When this is so the clutch will be correctly lined up and should work satisfactorily. When the engine is bolted down and the male part of the clutch is taken out of engagement by the pedal, then a pair of callipers can be tried all around between the male and female surfaces. This gives another proof of correct lining up, since if the distance is equal all round then the whole is linable.

Wherein Sparks Are Different

Supplying the proper ignition for explosive motors is a very delicate matter, and the good running of the engine depends on it to a very great extent; yet very often people engage in the manufacture of induction coils who do not sufficiently understand the requirements of the wares they turn out. Simple as the construction of an induction coil may seem, there are many difficulties to surmount before it can be placed on the market in such a condition as to warrant it giving proper service. It is easy to say that all you have to do is to take a bundle of iron wires and then wind round it a thick copper wire with a secondary winding of finer wire over it, and add a condenser and the most rapid trembler possible, and the result is perfection. This is not so. To succeed in making an irreproachable coil in every way suitable to the needs of the motor without producing any sparking at the platinum contact points, demands that you combine the iron wire core, primary winding, secondary winding, and condenser in their proper relationship, which are based on very complicated calculations as to the varying time of making contacts. Anyone who conscientiously tries to find out the principles of a coil would find it easier to make calculations for a continuous or alternating dynamo than for a simple sparking coil.

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**Information
Bureau**

OF

The Automobile Magazine

136 LIBERTY ST., NEW YORK CITY

WE DO not claim to know it all, but what we don't know we can find out for you—perhaps better than you can for yourself.

If you are having more than your share of motor troubles we can probably help you. Don't be bashful—send in your queries.

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This is absolutely true of **Hall's Skin Food**. You probably know from experience the ravages sustained by your complexion through Automobiling.

There is not to-day on the market a preparation equal to **Hall's Skin Food** for preserving the complexion, and is especially efficacious in removing the dust and foreign substances from the skin that you accumulate on a trip and cannot remove by the ordinary methods.

It is also a Tissue builder, will fill out the hollows in the Cheeks under the Eyes, soften those lines and generally improve the Face?

In short it will do wonders for the worst Complexion. Let us suggest that you try a jar of this preparation; you can make no mistake. Send us **\$2.00** and we will send you a jar, Prepaid.

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is a substitute for powder and just the thing if you are going for a ride. It cannot blow off and is invisible, giving to the Skin that fresh and soft appearance so much desired. It is antiseptic and will not injure the most sensitive skin; on the contrary, will stimulate and have a Tonic effect.

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Starting the Engine in Cold Weather

Some engines are very difficult to start in cold weather, or when they have stood unused for some considerable time. Raising and depressing the needle valve of the float chamber rather briskly two or three times sometimes has the desired effect, when the starting handle is rotated and the switch is on. If this fails, then a small amount of gasolene, injected by a syringe or can into the cylinders through the compression taps, will both thin the lubricating oil and ease the working parts, and also vaporize in the cylinders and fire easily when the attempt is made to start up. If no compression taps are fitted, a small hole might be made in the inlet pipe as close to the engine as possible, and the gasolene squirted in there. The holes can be covered over if required by means of a spring clip similar to those in use on bicycle pedal centers for covering over the lubricating holes.

Should you have occasion to remove a cylinder head never drive any kind of tool between the cylinder and the head.

Correct Cone Covering

A good fleshy soft leather is the best to use for replacing a worn cone cover. To perform this easily first cut a paper pattern to fit the cone on which the leather is to be fixed, and then have the leather cut by a shoemaker or a harness maker, to the pattern, allowing about $\frac{3}{8}$ inch longer than your paper pattern. To fix it first drill two 3-16-inch rivet holes in the cone surface, each about $\frac{3}{8}$ inch from either edge, then two corresponding holes in the leather about $\frac{3}{8}$ inch from one end. Countersink these to suit the coned head of the rivet and put the flesh side of the leather to the metal clutch and rivet up, taking care that the rivet head is at least 1-16 inch below the leather surface. When this has been done, pull

Columbia

A COLUMBIA car, Electric or Gasoline, contains more value than any other car to be had at its price. By value we do not refer particularly to the cost of design, materials and workmanship—which is very high in *Columbia* cars—but to efficiency, dependability and other practical excellencies which account for the reputation of the *Columbia* name and which form the real basis upon which to estimate the worth of a car.



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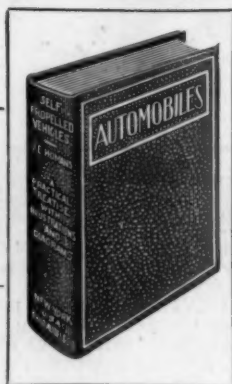
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AUTOMOBILE MAGAZINE

136 LIBERTY STREET

NEW YORK

XX

In answering advertisements please mention THE AUTOMOBILE MAGAZINE.

the leather round the cone and drill alternately at intervals of about 2 inches, keeping the leather tight meantime, and putting in the rivets as you go on. After finishing this evenly, the leather must be turned up in a lathe to suit the female part of the cone, then dress it several times before using with castor or colan oil to make it flexible. Be careful that the cone is not turned to go in too far, but some allowance should be left for wear.

Novices in motor matters should be very careful to see that the ignition lever of any car they are driving is retarded before they attempt to start the engine. Otherwise the really dangerous blow of a "back-fire" may be their very unpleasant experience.

Mending Cracked Cyclinders

An easy way to try and stop a water jacket from leaking is to make a strong solution of sal-ammoniac with boiling water. Pour this into the jacket after the pump and radiator have been disconnected, and the outlet holes in the jacket have been stopped up. Allow the solution to stand for a day, or longer if necessary. If the crank is a very small one you may be able to treat it from the outside by cleaning the surface at the crack with a file, then with a hot soldering tool warming the part along the crack and fluxing it with a piece of solid sal-ammoniac, afterwards carefully tinning the surface with a stick of solder. In this way it may be possible to make a satisfactory job if a good tinsmith does it. Another way would be to fit a piece of steel plate over the crack so that tapping holes could be drilled round the crack outside it. When this had been done, a piece of steam joint rubber could be used to pack between the plate and jacket, and 3/16-inch or 1/4-inch set screws employed to hold the lot together and make a satisfactory joint. The



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When your Gasoline motor or gas engine gets stubborn? This can be quickly learned by consulting the

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BOOK DEPARTMENT, AUTOMOBILE MAGAZINE

Thermit process, where you can have it applied, is one of the surest and best means of making the cracked cylinder whole again.

Should Battery Acid Escape

If any of the acid from the accumulators show a tendency to spill or slop over, stop it immediately. The procedure of doing this effectually varies considerably with different accumulators. If it is impossible to stop the overflow at once, the action of the acid will set up corrosion and spoil the adjacent fittings, if it does no worse. An excellent plan is to cover the bottom of the battery boxes about an inch deep with bicarbonate of soda. This is an alkali, and neutralizes the acid. Being a clean white powder, it can be left in the box and does no harm, and is ready for each drop of acid that splashes out. This substance is a simple and cheap one, and work can be done on the spot immediately the bicarbonate has been applied, which is not the case with ammonia, owing to the strong fumes given off. The bicarbonate is supplied by any grocer or druggist, and quite a lot can be bought for five cents.

Valve and Spark Plug Leaks

The joints of the sparking plug and the valve caps are frequently blamable for a loss of compression, but both of them can be made perfectly tight by using copper-asbestos washers and screwing down tightly. If these washers are not available for the valve caps a piece of thin asbestos string wound under the flange in the same direction as the screw thread, and covered with a little lubricating oil, will make a sound joint. To find out whether there is leakage at these points when the engine is working, go round the joints with an oil can; any blow will be immediately detected by the bubbles. Turning up the exhaust valve seating and grinding it in, would,

Leon Rubay

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170 Broadway,
New York City

of course, bring the bottom of the valve stem closer to its tappet, so that probably the valve cannot come down far enough to make a good joint on its seating, in which case the tappet top should be filed until about one thirty-second inch clearance is given between the valve and tappet, when the valve is fairly on its seat. If the valve seating is not concentric with the valve, no amount of grinding in will make a satisfactory joint.

Never permit the spare inside tubes to drag in the instrument box or upon the floor of the car. Avoid contact between them and oily bodies, or pointed, hard or cutting objects.

Some High Efficiency Shown

An interesting series of trials has been carried out at the laboratory of the Automobile Club of France with the dynamometric mill of Colonel Renard to ascertain the efficiency of mechanical transmission gears. The test was made with a car propelled by a four-cylinder engine. It was found that with the engine running at 1,520 revolutions a minute the power developed was 18.9 H. P., and on the second speed the power measured on the hubs of the driving wheels was 14.42 H. P., thus showing an efficiency of seventy-six per cent. At the third speed the engine developed its maximum power of 19.1 H. P. at 1,500 revolutions, and the dynamometric mill on the driving wheels registered 15.04 H. P. The mechanical efficiency was, therefore, seventy-nine per cent. This, however, rose to eighty-nine per cent. on the top speed with direct drive, when the motor developed 19.04 H. P. at 1,495 revolutions per minute, and the power on the hubs of the wheels was shown to be 16.89 H. P. It must be remembered that the car was a new one, and, presumably, carefully prepared for the trial. Nevertheless, it must be admitted that such an efficiency, even under favor-

Regardin' Our Fine Performance in the Vanderbilt Cup Trials

Some people have expressed surprise at our ability to beat out special built racing machines with our regular stock motor car. Those of you who own **Royals**, or have had a ride in a **Royal** car, know why it was so easy for us to come in third in the race.

¶ The **Royal Tourist** is built to keep on movin'—on the tour—in the race—in the city streets—she always keeps pegging along without noise, trouble or annoyance. We are advertised by our customers. Ask one.

ROYAL

THE ROYAL MOTOR CAR CO., Cleveland, Ohio

AGENTS: C. A. Duerr & Co., 58th and Broadway, New York; G. J. Dunham, 183 Columbus Ave., Boston; The McDuffee Automobile Co., 1449 Michigan Ave., Chicago; G. W. Caplin, 424 South Fifth St., Minneapolis; Automobile Supply Co., Ltd., 24 Temperance St., Toronto; Motor Shop, 317 N. Broad St., Philadelphia; Westminster Automobile Co., 4396 Olive St., St. Louis.



The **THOMAS FLYER TOURING CAR**

*Said
and
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"Wins Minneapolis Hill Climb over all American Cars, 2000 feet, 10% grade, 34¼ secs."

"My car has beaten everything in this city in the shape of an automobile."

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tive book, containing also a list of Hotels and
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LONG ISLAND RAILROAD

A. L. LANGDON, HOWARD M. SMITH,
Traffic Manager Genl. Pass. Agt.
263 Fifth Avenue, New York

able conditions of running, is remarkably high, and affords some strong testimony in favor of direct drive. This is the first time that the mechanical efficiency of a car has been tested scientifically by a process which gives absolutely accurate results.

Clean Up When You Come In

When a car has been out on muddy roads, it is always advisable to thoroughly cleanse the mud off with a hose and properly finish the cleaning of the paint work with a smooth wash leather. The reasons for this are fairly obvious, since if the car is put away without cleaning the mud dries on it, and much more labor and time are then required to remove it. Again, when moisture or mud is allowed to remain on the car, it tends to make it very dull, the varnish is spoiled, and what should otherwise appear as an attractive turn-out will then partake of the nature of a shabby, dilapidated, second-hand affair, not worth nearly the amount which it really is. First appearances go a long way, and a good impression is always caused by a good, well-cared for car. It may also be necessary to occasionally run out at a moment's notice, so that the car should always be left ready in every respect to take the road.

Detecting Short Circuits

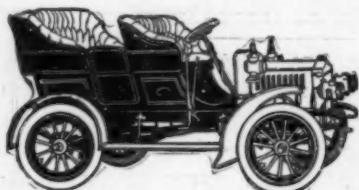
A good and rapid way to test all parts of the ignition circuit is to run the engine in the dark, whereupon the slightest leakage from the high-tension wires or around the porcelain of the plugs will be at once seen by the faint light which indicates a short circuit. Examine all the points of the primary circuit, where any part of the metallic frame or other metal is touched by the insulated wire, as this may have been worn or cracked through the insulation. The jarring or vibrating produced by the car's running occasionally causes the

16 H. P.
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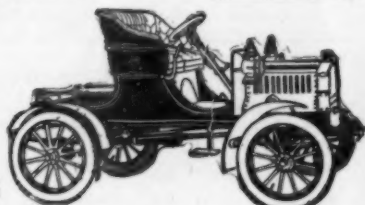
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conducting wire to touch the frame, and thus becomes responsible for a misfire. If the high-tension insulation is carried out with a poor quality of rubber, or is too thin, "shorting" may take place at any part. The slightest film of moisture or lubricating oil on the outer part of the plug porcelain also tends to lead away the spark and to consequent misfiring.

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When a water jacket begins to overheat and the ordinary causes for its doing so have been sought for and found missing, it is well to suspect that there has been formed a coating of lime inside the jacket deposited there by the evaporation of the water. To make short work of the removal of this deposit, see that a strong solution of ordinary caustic potash is circulated through the system by running the engine for an hour. This will surely loosen

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Carbide which is perfectly fresh can be told by its steely grey crystalline appearance, and the sharp fracture of the lumps, which when they have been exposed to the air lose their sharp edges and become rounded and more uniform in size and shape. Carbide which has been used possesses a mealy white appearance, as well as a pungent odor, which is more marked than in carbide which has not been moistened.

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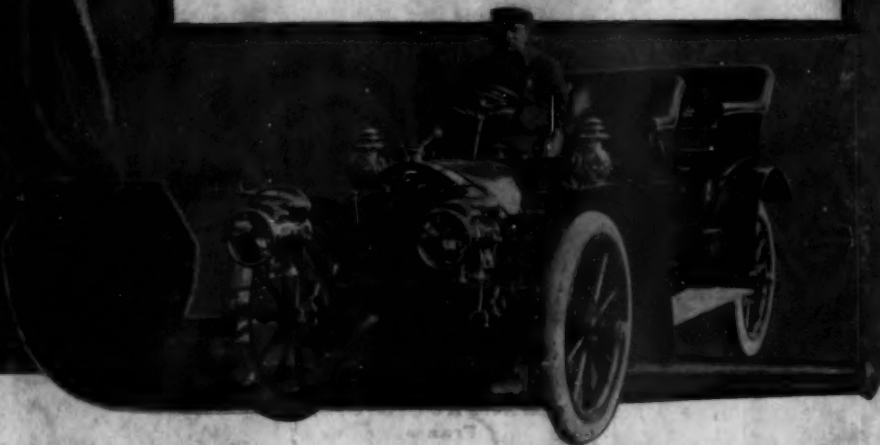
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Cylinders Separate or in Pairs?

From the ordinary point of view, the car which has its cylinders cast separately should be considered, on the whole, more satisfactory than one which has them cast in pairs, even though the cylinders by this arrangement take up more space, and require many more bolts, nuts and water connections. Should one of the separately cast cylinders go wrong or crack as a result of freezing, the cost of replacing it will be about half the cost of having to replace a pair. The single cylinder is much easier to remove in case of a broken piston ring, being so much lighter, and the piston is much more likely to be set true to the cylinder than would be the case in a pair of cylinders, added to all of which is the very desirable thing that the cooling surface is very much greater in the single cast cylinder.

Driving on partly deflated tires is often responsible for the breaking away of the beaded edge. Most drivers, however, are well aware of the evil effects arising from this, and for their own sake as well as for the sake of the tires, take every precaution to keep the tubes properly inflated.

Made Up of Different Boilers

Ordinary gasoline as sold to automobilists is a mixture of hydro-carbons commencing with one known to chemists as pentane, so called because having five atoms of carbon, and going up to molecules, having 9 in 10. This is a description which will not be very enlightening except to those who are chemically educated, so perhaps a quicker understanding will be reached in another way. If you start to heat up a liquid like water, and put a thermometer into it, you will find that it begins to boil, for instance, at 100 degrees Centigrade, and that it will go on boiling at 100 degrees Centigrade till it is all gone.

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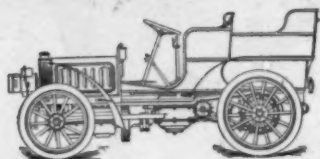
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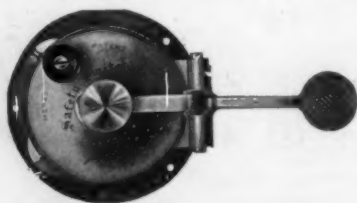
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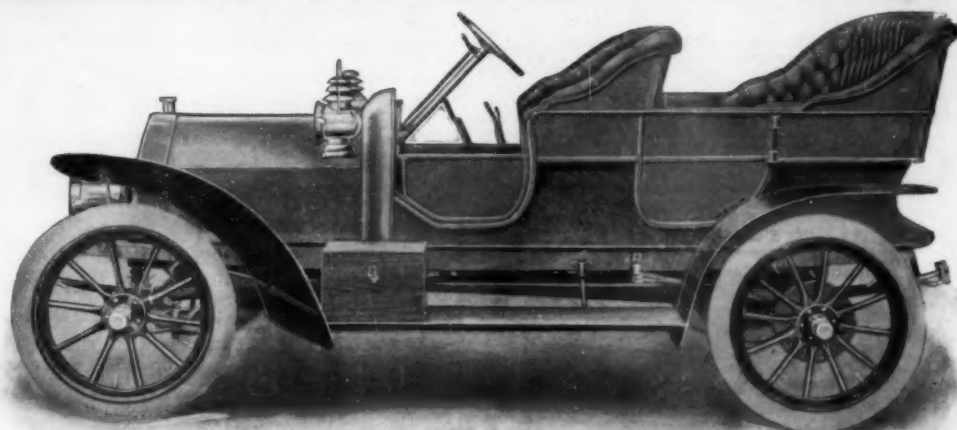
HERZ IGNITION CO., 189 Elm Street
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That is because water is a homogeneous subject. If you take a mixture such as gasoline, however, you will find that it begins to boil at about 80 degrees Centigrade, and some of it goes over, then the thermometer goes on rising and rising, and does not finish rising until practically the whole of the liquid is gone over, and you will find the temperature to be as high as 222 degrees—that is to say, gasoline consists of a mixture of organic compounds, some of which boil at 80 degrees and others at over 220 degrees Centigrade. Obviously, a fuel made of a mixture of things like this, all having different properties, all being differently volatile, having different boiling points, is a long way removed from being an ideal motor fuel. Now, alcohol is a chemically homogeneous substance; like water, it starts to boil at a certain temperature, and it finishes boiling at the same temperature. That is about 80 degrees Centigrade, thus suiting what automobilists consider ideal conditions far more completely than gasoline does.

While direct drive on the top speed is undoubtedly an advantage in high-powered cars, for small cars it is doubtful, since it entails a double gearing, in most cases, on all the other speeds, which means a certain loss of power.

Steering Joints Need Attention.

No small amount of wear on the tires of the front wheels is due to the steering wheels not being parallel with each other when the car is progressing in a straight line. It will readily be seen that if there is play in the steering lever pins, the wheel can, figuratively speaking, spread out at the front so that a line drawn through each of the front wheel tire centers would, if produced, meet at some point in the rear of the car; it is, therefore, very evident that the tire



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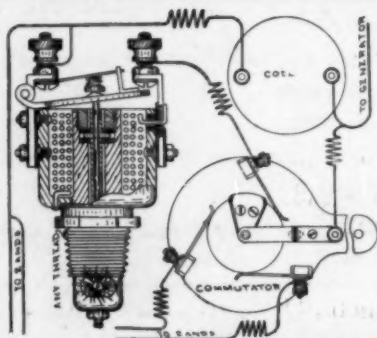


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must be skidding all the time where it makes contact with the ground, thereby being subjected to excessive wear. This is a point not generally appreciated, and in many cases where owners of cars experience trouble with excessive wear of the front tires, a brief examination as to the lineability of these front wheels would at once point to the cause of tires wearing out so soon. The steering joints on a car should always be covered with a leather casing, properly fitted, so that dirt and mud can not get access to the joints; at the same time the joints must at all times be kept either lubricated or well greased.

It is an excellent idea to utilize bad weather to thoroughly overhaul and repair your tires. Do not forget that repairs, especially to outer cases, take considerable time to make, and by taking advantage of this suggestion you will not be deprived of your car when the coming of better weather gives you the desired opportunity to enjoy it.

Importance of Good Brakes

While the brakes play such a very important, in fact the most important, part in the car, especially as regards its occupants, and their lives, makers would do well to pay more attention to these life-saving equipments than they do. How many makers construct brakes which run clear of the drum when they are not in use? The modern brake is more or less a receptacle for all the dust, dirt and oil, and from its very inaccessible position, is seldom or never cleaned. The band is always rubbing at some point or another, so that it wears itself through in time, and then proceeds to break at a very inopportune moment. When not breaking, its braking takes off a lot of the rotary movement of the wheel or shaft. For example: Try jack-



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ing up a front wheel and then revolving it. You will find that it will revolve, say fifty times, but if you only slightly rub one finger on it, it will probably not revolve more than half that number, thus showing the retarding effect of even a slight friction. A well-made brake should be wide and internal, expanding on the rear wheels; external expansion usually making too much rattle. It should be thick in construction, easily adjustable by a right- and left-handed screw, pulled on to its work by rods, not by a wire or a rope, and should be absolutely clear of the drum when "off." Chain-driven cars should all be fitted with a third brake, especially in the high-powered cars, in case the chain should break going up or down a steep hill. The importance of having a car properly braked cannot be too strongly emphasized.

Even with excessive lubrication, valves never become foul unless they fit their seating imperfectly. Hence a foul valve is a sure indication that it requires grinding.

When the Harvest Days Are Over

At the end of a season it is advisable to take off each of the tires in turn and go carefully over them to see that no dirt or other erosive substance has worked between the outer cover and inner tube, since after a time this invariably rubs a hole in the inner tube. If the tires are sound and if they do not appear to be badly worn, they can be at once replaced, care being taken to either lightly rub the inner part of the outer cover with flake graphite or with plenty of French chalk, so that when heated through running the inner tube will not stick to the outer cover. If the canvas should show signs of rotting through the penetration of moisture, the cover should be returned to the makers for

Columbia

A COLUMBIA car, Electric or Gasoline, contains more value than any other car to be had at its price. By value we do not refer particularly to the cost of design, materials and workmanship—which is very high in *Columbia* cars—but to efficiency, dependability and other practical excellencies which account for the reputation of the *Columbia* name and which form the real basis upon which to estimate the worth of a car.



Columbia Electric Brougham, New Model, Mark LXVIII

FOR WINTER USE

COLUMBIA 35-40 h. p. LIMOUSINES and LANDAULETS, price \$5500, are the most perfect gasoline cars for cold weather service. No others compare with them in completeness of equipment and elegance of finish and appointment.

¶ The new model COLUMBIA ELECTRIC BROUGHAM, Mark LXVIII, price \$4000, provides an ideal conveyance for town use. It is the lightest, fastest and easiest riding electric carriage in the coach class. It has five speeds forward, with a maximum of 18 miles per hour, and is furnished in "de luxe" style throughout. Regular equipment includes MICHELIN PNEUMATIC TIRES.

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BOSTON—Columbia Motor Vehicle Co., 74, 76, 78 Stanhope St.

PHILADELPHIA—Pennsylvania Electric Vehicle Co., 250 North Broad St.

CHICAGO BRANCH, 1332-1334 Michigan Ave.

WASHINGTON—Washington E. V. Transportation Co., 15th St. and Ohio Ave.

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are the accepted
**Standard. Quick-
Acting, Automatic
Lowering, Easily
Operated. Lift One
Ton, dead weight, and
adapted to any auto-
mobile. The only sub-
stantial and reliable
Automobile Jacks on
the market, and they
can be readily carried
as part of the equip-
ment of any automobile. SEND FOR CIRCULAR.**

THE DUFF MFG. CO.
Works, Allegheny, Pa. **PITTSBURG, PA.**

examination and repair. If the tread is worn very thin, or if it is badly cut in places, the makers should also have the cover to vulcanize on it another tread, which, of course, will make the tire last for several thousands of miles more running. In the case of small cuts, they may possibly be patched up by the owner. Blistering of the tires is usually due not to dirt picked up from the road, as a number of people imagine, but to internal friction between the canvas and the rubber of the cover. The makers are the best people to treat defects of this nature. If it is necessary to replace the tires by new ones, when doing so, fit the largest possible section of tire that the rim will take.

A rubber connecting pipe may be repaired, if leaking or burst, with a tire patch well bound with tape.

Putting On a Patch to Stay

As a rule car owners and car drivers alike patch the inner tubes of tires very badly. Either at a stopping place, when a spare tube has been substituted after a puncture, or on the road when the puncture occurs and you have not a spare inner tube, it is a good thing to know how to put on a patch properly so that the repair may be thoroughly substantial and not come off till the car has with it traveled many a mile. A satisfactory repair of this nature can only be made on the tire of a light and not too speedy a car. Speaking generally and even if the patch is well put on, it will not stand on the large inner tubes used on heavy cars, which travel at high speed. In cases of this kind it is indispensable to have the tube vulcanized. But for a light car it is a different matter, and any one can make a durable repair if he follows these instructions.

DURYEAS RUN ALL WINTER

The Duryea Auto is **very light**, but it carries most of its weight on the **large rear wheels**. It is the only auto which does this and consequently the only one which has **enuf traction** to run without slipping on **ice, mud, slush or deep snow**. Another thing, it has **high road clearance** and is **absolutely reliable**. Fourteen years' experience has taught us how to make it so. A doctor must use his auto all year round.

OVER 75 PER CENT. OF OUR USERS ARE DOCTORS

DURYEAS POWER CO. - 30 C St. - READING, PA.

A C M E MOTOR C A R S

- Sure Starting
- Sure Stopping
- Sure Going
- Sure Coming

Reliable in any emergency—in any weather—on any road.

TYPE VIII. Fastest Touring Car in the world at the price. Complete, \$2750.

TYPE X. A Runabout built like a Racing Car. Completely equipped, \$1000.

Demonstration in Ten Cities.

ACME MOTOR CAR CO., READING, PA.

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Across Lake Erie Between Twilight and Dawn

THE D. & B. Line Steamers Leave Detroit daily at 5.00 p.m. (central time) and Buffalo daily at 5.30 p.m. (eastern time) reaching their destination the next morning after a cool, comfortable night's rest en route. By special arrangement all classes of tickets reading via the Michigan Central, Wabash and Grand Trunk Railways, between Detroit and Buffalo, in either direction, are optional and will be accepted for transportation on the D & B. Line.

Detroit & Buffalo Steamboat Co.

A. A. SCHANTZ, *Gen'l Supt. & Pass. Traf. Mgr.*
Detroit, Mich.

The first step consists in thoroughly cleaning with benzine, or gasoline if you have no benzine, the two surfaces to be stuck together. It is absolutely necessary to remove from these surfaces every particle of extraneous material, dirt, grease or oil. The second step consists in scraping or rasping these two pieces, in order to roughen the two surfaces to be cemented together, thereby insuring solidity and strength to the repair. But in order that this roughening may be done under proper conditions, it is absolutely essential that the preliminary cleaning be well and thoroughly performed. If the scraping is done while there is a particle of grease or foreign matter present, the operation is uneven and detrimental to the final result. For the roughening use a shoemaker's rasp, which can be bought anywhere, or even a fine wood rasp. Failing a rasp, use glass or sandpaper of a fairly rough grain. After scraping the two surfaces well, it is necessary to clean them again with benzine or gasoline, in order to remove the particles caused from the scraping. Having cleaned the surfaces very carefully, they must be coated with rubber solution. Proceed as far as you can, to employ as many coatings as possible, letting each one dry successively. As the solution dries sufficiently, shown by sticking to the fingers, the time is right to put on another coat of solution or the patch which should be carefully done and the repair is made. Follow these instructions and you'll surely get satisfactory results.

"He says he has perfected plans that will enable him to build and sell automobiles at the same price as bicycles."

"The idea! That means a great business undertaking. H'm! It also means a great undertaking business."

"Rigs
That
Run"

TWO MODELS FOR 1906

Model A—4 cyl. \$2200

Model B—4 cyl. 2500

ST. LOUIS
MOTOR CAR CO.
Peoria, Ill.

Modoc Automobile Cleaner

Cleans thoroughly and restores the lustre without affecting the varnish. It is without doubt the best automobile cleaner on the market. Sample and directions furnished on application. Price per gallon, \$1.00, f. o. b. Chester; packed in tin, wooden covered cans

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CHESTER, PA.**

Special Announcement

AN INVITATION is extended by the management of the **HOTEL GALLATIN** to any white merchant or his representative outside of New York City, whose name appears in Bradstreet's or Dun's Commercial Agency Book, to accept the hospitality of the Gallatin Hotel, 70 West 46th Street, for three days without charge. Usual rates, apartment with private bath, \$3.00 per day and up, without meals. Parlor, bedroom and private bath, \$35.00 per week and up, with meals for two :

**GALLATIN HOTEL
70 W. 46th St., New York City**

Wear in the Steering Gear

Once in a while take hold of the steering wheel and slightly rotate it backward and forward as though steering, but without moving the road wheels. This will show you the amount of play existing between the steering stem screw and the quadrant in which it engages, and a heavier twist, without moving the wheels, will then further show what play there is in the steering lever joints themselves. To take up any play in ball joints, it is only necessary to adjust the joint cap, but in the levers, where plain pins are fitted, and where more than one-thirty-second of an inch in play is found, it is advisable to renew the pins with others made to fit in the holes. In the case where the holes have worn oval, it may be necessary to ream them out before turning fresh pins to fit them.

When the worst comes to the worst we have to make the best of it.

Plugs—Piston Top or Cylinder Side ?

The above question is often discussed, and although there exists a difference of opinion on the point, it would seem as though if the plug is placed so as to fire the charge directly on to and above the piston, it must have more force than if fired "round the corner," so to speak. Any kind of transmission of force which is not direct must lose some of its power. It has been proved that large quantities of powder, as used in the big guns, when not ignited in the center, do not give off so much force. Nor are the contents of cylinders likely to be simultaneously fired if not ignited absolutely in the center; in fact one must think the only excuse makers can find for placing the plug at the side of the cylinder is for convenience of position, especially if the cylinder is fitted with the ordinary induction valve.

By Royal
Warrant
to His
Majesty
The King



Over
50 Gold
and Prize
Medals
Awarded



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"SPECIAL" and "WHITE LABEL"

(The Fine Old Highland)

(The Whisky of Great Age)

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and
FIND
OUT**

NO MATTER what you want to know about an automobile, its power, maker, price, stability, suitability, or anything else, can be quickly ascertained at no additional expense other than for the postage employed in stating your difficulties

TO THE

**Information
Bureau**

OF

The Automobile Magazine

136 LIBERTY ST., NEW YORK CITY

WE DO not claim to know it all, but what we don't know we can find out for you—perhaps better than you can for yourself.

If you are having more than your share of motor troubles we can probably help you. Don't be bashful—send in your queries.

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**Heals Cuts, Abrasions, Hang-Nails,
Chapped and Split Lips or Fingers,
Burns, Blisters, etc. Instantly
Relieves Chafed or Blistered
Feet, Callous spots, etc., etc.**

Applied with a brush and immediately
dries, forming a tough, transparent, col-
orless waterproof coating.

"NEW SKIN" will heal injuries,
will not wash off, and after it is ap-
plied the injury is forgotten, as "NEW
SKIN" makes a temporary new skin
until the broken skin is healed under it.

SHOULD BE IN EVERY AUTOMOBILE KIT.

Each	
Pocket Size (Size of Illustration) .	10c
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An Automobile Necessity

This is absolutely true of **Hall's Skin Food**. You probably know from experi-
ence the ravages sustained by your con-
plexion through Automobiling.

There is not to-day on the market a preparation equal
to **Hall's Skin Food** for preserving the complexion, and is
especially efficacious in removing the dust and foreign sub-
stances from the skin that you accumulate on a trip and
cannot remove by the ordinary methods.

It is also a Tissue builder, will fill out the hollows in the
Cheeks under the Eyes, soften those lines and generally
improve the Face?

In short it will do wonders for the worst Complexion.
Let us suggest that you try a jar of this preparation; you
can make no mistake. Send us \$2.00 and we will send you
a jar, Prepaid.

Hall's Almond Violet Cream

is a substitute for powder and just the thing if you are
going for a ride. It cannot blow off and is invisible, giving
to the skin that fresh and soft appearance so much desired.
It is Antiseptic and will not injure the most sensitive skin;
on the contrary, will stimulate and have a Tonic effect.

You should have this on your toilet table.
\$1.50 per jar. Sent Prepaid upon the
receipt of the price.

**F. C. HALL & CO., 150 Nassau St.
Suite 424 NEW YORK**

Strange Cause of Stopping

An item that comes under the clas-
sification of strange causes of the
motor's sudden halting on the road,
which is so frequently adverted to as
not to merit again dwelling on it were
it not for the fact that this is an un-
usual variation of it, is the stoppage
of the air vent in the gasoline tank.
In runabouts and other light cars
wherein it has been the practice with
many builders to locate the tank di-
rectly under the seat, it has been
found that sagging of the latter has
sometimes sufficed to close the vent
to the infinite vexation of the driver,
since the moment he left his seat to
investigate the cause of the trouble,
the trouble ceased and the motor
started off again just as nice as you
please, only to be repeated again in
the course of a quarter hour or less.

A manufacturer never knows what a
genius he really is until he gets into the
hands of a first class write-up artist.

Proper Care of the Emergency Brake

It is most important, in those cars
which have the emergency brake con-
nected by means of wire rope, to keep
close watch over the latter to see that
it is not becoming frayed or rusted.
It must be remembered that the rope
itself, as well as applying the brakes,
also serves to equalize them, hence
it is most important that its function
in this respect shall be fulfilled at all
times. To insure the rope's doing
this it should be kept well greased at
the points where it is bent over the
arms; furthermore it is a good plan to
undo the connection at one end about
"once in so often" and to draw it part-
ly through in order to inspect it thor-
oughly.

The clip, which is frequently used
to fasten the ends, in most cases is of
but little use, as it will almost invar-



1906

1906

New Type XII 35=40 H. P. Pope=Toledo

Every one in the trade the world over is now familiar with the unparalleled record of the justly renowned POPE-TOLEDO. Months of careful study have enabled us to produce our new Type XII, a thoroughly reliable touring car of great power.

MOTOR: Consists of four individual, twin-head cylinders, 4-cycle copper jacketed, developing under brake test 43-44 H. P., all gears encased. The very remarkable result has been attained of **securing one H. P. for every ten and eight-tenths pounds of engine weight.**

TRANSMISSION: Sliding gear type; three speeds forward and reverse; made of the best steel obtainable. Ball bearings at all important points.

FRAME: All steel, tested to a load far exceeding what is required.

BODY DESIGN: Entirely new and original, double side entrance, very roomy tonneau.

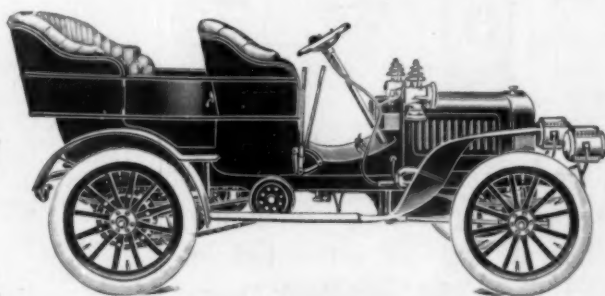
Order now for early delivery. Price, \$3500

In the meantime we have for **immediate delivery** our new Type X, 20 H. P. touring car, fresh from the factory—a light, wieldy car, combining efficiency, comfort, style and durability. **Price, \$2800**

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MOTOR
CAR
COMPANY**

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BOSTON, MASS.
223 Columbus Ave.
WASHINGTON, D. C.
819 14th Street



TYPE X. PRICE, \$2800

A. L. A. M.



"Century"

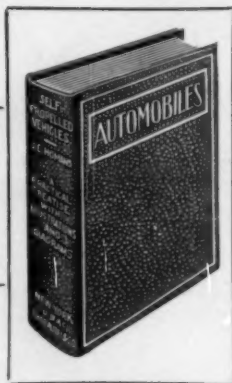
Ask your dealer to show you the best camera in the market today, for both plates and film. If he does, it will be a "Century."

The 1904 Models have a **Revolving Back**—the most useful and valuable improvement made in recent years.
Complete Catalog free for the asking.

CENTURY CAMERA CO., Rochester, N. Y.

Just Issued

Price
\$2



Price
\$2

A popular edition for owners, operators, repairmen, intending purchasers and all interested in automobiles. Address Book Dept.

AUTOMOBILE MAGAZINE
136 LIBERTY STREET NEW YORK

ably slip under sudden strain, nor are any of the more ordinary forms of fastening of much use for the purpose. Instead of relying upon anything of the sort, it is better to make a complete wire rope splice in each end, allowing for considerable stretch when the rope is new, and to "serve" it carefully with soft copper wire which is afterward tinned with soft solder. This is a somewhat tedious process of making a fastening, but once it is made the splice will never give under any circumstances, so the making of it is well worth the while it takes. Any subsequent adjustment as to its length may be made readily by simply twisting or untwisting the rope until the proper tension is obtained.

Fuller's earth, which can be obtained from almost any drug store, is a good dressing for a slipping friction clutch.

If the Coil Gives Trouble

When all else fails, and after the twentieth round of the machine, with a trial of every experiment that knowledge or experience suggests, and the thoroughly exasperated driver still finds himself at the side of a country highway with a motor that deliberately and obstinately refuses to "mote," try the "innards" of the coil. Granted that the battery has not outlived its usefulness, the carbureter has not laid down, the gasoline has not given out or the water ditto, and the engine overheated or any one of the hundred and one other things that have to be tried sometimes before the trouble is located. Of course, little out of the way things like the air vent in the gasoline tank becoming stopped have not occasioned the trouble; all of the commoner faults have been searched for carefully and found lacking, then explore the coil; that is, where it is the only one. If there be

An Affidavit That Speaks Volumes:



"Every Stock Car Guaranteed to Show Sixty Miles an Hour Before Leaving the Factory."

—E. R. THOMAS

Can any praise of ours compare with the eloquent testimony concerning the 1906 Thomas contained in this remarkable affidavit?

Buffalo, N. Y., Nov. 10, 1905.

This is to Certify, That we, the undersigned, this day rode at the rate of sixty miles per hour with five passengers over average roads, maintaining a speed continuously, in regular stock Model 1906 THOMAS touring car, and went up a 14% grade with five people, on the high speed and on very bad roads, increasing the speed all the way up the hill until we reached 40 miles per hour at the top.

The car is exceedingly smooth and quiet in operation, and the clutch is extraordinarily sweet and effective.

This the only American built stock car that within our knowledge has made 60 miles per hour on ordinary roads, even without passengers.

(Signed)

AUBREY H. MARTIN, Philadelphia, Pa.	C. A. COEY, Chicago, Ill.
F. W. DART, Hartford, Conn.	C. S. HENSLOW, Boston, Mass.
F. B. HARPER, Beverly, Mass.	A. M. SPEAR, Jr., Portland, Me.
A. S. ROBINSON, New York.	RAYNOR GODWIN, Brooklyn, N. Y.

State of New York, }
County of Erie. }

Sworn and subscribed to before me this 10th day of November, 1905.

ARCHIE I. DRAKE, Notary Public.

The E. R. Thomas Company

1421 Niagara Street - BUFFALO, N. Y.

Members Association Licensed Automobile Manufacturers

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ESTD 1840.

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**A Small Piano of
Large Power and
Wonderful Sweetness and
Purity of Tone Quality**

Its case architecture possesses a charm to please the most fastidious.

Its durability of construction is pronounced and thorough.

It occupies a trifle more space than the Upright.

It must be seen and heard to be appreciated.

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Do You Know What to Do and How to Do It

When your Gasoline motor or gas engine gets stubborn? This can be quickly learned by consulting the

Practical Gas Engineer

**A Book of
150 Pages**

By E. W. LONGANECKER

Twelve years' constant experience with Hydro-Carbon Engines.

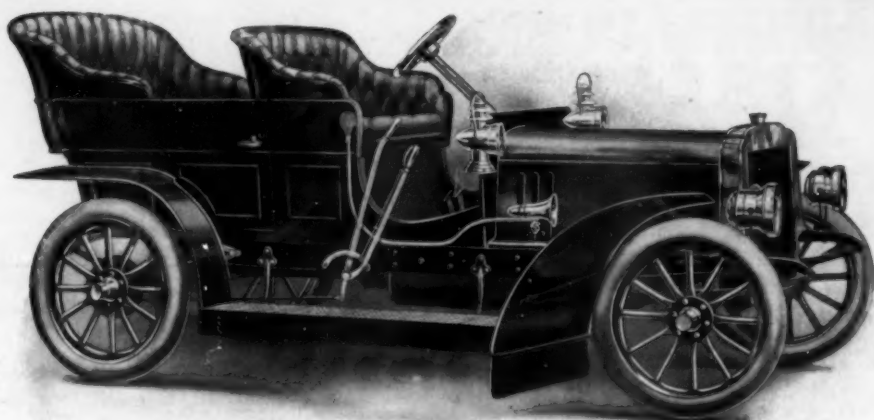
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BY THE

BOOK DEPARTMENT, AUTOMOBILE MAGAZINE

a spare one a few minutes will suffice to put it in place of the damaged one. If there be one for each cylinder it is easy enough to cut out the one that has broken down and proceed with three.

But where there is only one, and that very valuable item in time of distress, a spare, is not at hand, take a careful look at the connections of the coil—that is, the leads for the vibrator and the secondary; probably they cannot be seen, as they come through the wood or vulcanite base on which the vibrator is fixed directly to the binding posts. This makes the break, if there be one, much more difficult to locate. It is far from being a common occurrence, but excessive vibration will sometimes cause it; and while its rarity is a matter for congratulation, it will sometimes happen to the best made coil ever turned out. When the parted connection has been located by exploring—this process, of course, varying largely with the make of the apparatus—it will be a very simple matter to repair, and the result will repay the searcher. It is a desperate expedient, indeed. Unless certain that absolutely every other part that can fail has not done so, it is as well not to bother the inside of the coil.

Considerable judgment is necessary for the proper cooling of the cylinder so as to keep it from getting too hot on a heavy load when the explosions and impulses occur at every second revolution. While the right kind of cylinder oil will aid very materially in doing this, still an occasional removal of the piston from the cylinder and a thorough cleaning of it and the ring grooves may also be necessary, since the grooves often become foul and clogged with burnt carbon.



1906 Ford 6-Cylinder Touring Car

Price, \$2500

Six cylinders, 40 h. p., 4 to 50 miles per hour on high gear. *Perfected* magneto ignition—mechanical oiler, 114-inch wheel base, luxurious body for five passengers, weight 2000 pounds.

1906 FORD Runabout

as advanced as our touring car in design and even more surprising in price—will be fully illustrated and described in our next advertisement.

Both these Cars on exhibition at
the New York Automobile Show

FORD MOTOR COMPANY

DETROIT, MICH.

Members American Motor Car
Manufacturers Association, Chicago

Canadian Trade supplied by the Ford
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In answering advertisements please mention THE AUTOMOBILE MAGAZINE.

xxiii

GABRIEL HORNS



Blow from exhaust, enabling the driver to give entire attention to the car, eliminating constant watching which mars the pleasure of an auto ride.

Warn without frightening, having a clear, far-sounding, musical blast. Are made of highly finished brass, in three sizes.

Nothing to get out of order, and are easily attached to any car, steam or gasoline.



Have you heard our eight-chime horn? An octave on which you can play any tune. When purchasing be sure the horn has our trademark.

The GABRIEL HORN will be on exhibition at the New York Automobile Shows, Madison Sq. Garden and No. 20, 69th Regiment Armory.

Write for Catalogue and prices.

The Gabriel Horn Mfg. Co.

972 Hamilton St., Cleveland, O.

New York Representative, 148 W. 56th St.



The Automobile Magazine

wants interesting photographs and clever stories. Can you not supply one or both? Address Editor, THE AUTOMOBILE MAGAZINE, 136 Liberty Street, New York.

We Are Ignition Specialists

If you have any trouble with your ignition, write to us and we will tell you just what to do. Our

Apple Automatic Sparker

gives a strong, steady current that never fails. No trouble to put on any car or engine; our friction-driving gear makes installation easy. See the year entire car has an Apple electrical equipment. For full information write THE DAYTON ELECTRICAL MFG. CO., 170 Beaver Bldg., Dayton, O.



Valve Spring Testing

With automatic inlet valve springs it is absolutely essential to keep them always at the strength necessary to give their best results, consequently every spring fitted to a valve should be tested against the standard. This can be done by having a spare valve and seating fitted up with the standard spring complete, then press the stem of its valve against the stem of that to be tested, when it is similarly fitted up. If correct, both valves should open exactly at the same moment, since the pressure tending to lift them from their seat will be equal. If the refitted spring is too strong, then shorten by nipping off a little of it with the pliers; if too weak, pull out carefully a little to strengthen it.

It is no exaggeration to say that the gasoline motor is as sensitive as a child and as quickly resents any overtaxation of its powers or any abuse of its functions. If the driver understands the motor's limitations, and knows how to handle it to best advantage, it may invariably be relied upon to do all that is expected of it, but if he abuses it, either by overloading it or by throwing on the load with a jerk, its service will be correspondingly unsatisfactory.

Leaks Around Igniter Plug, Etc.

When the igniter is in the form of a plug and it is screwed in or clamped in by means of bolts, care must be exercised to see that the seat which makes the joint is maintained tight, since a small leakage may decrease the compression of the gas, and this, in turn, will materially cut down the power which the engine is capable of generating. Each foot of the explosive mixture of air and gas or vapor contains sufficient energy to do a certain amount of work when it is at atmospheric pressure, and if, after

SIXTH NATIONAL Automobile Show

AT MADISON SQUARE
GARDEN, NEW YORK

January 13th to 20th, 1906

JAMES C. YOUNG, Manager

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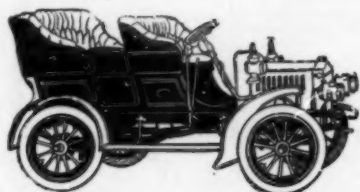
"On course I hain't attemptin' to deny that these devil-wagons do go tarnation fast, but I reckon' I traveled a mile faster than the best of 'em ever did more'n twenty years ago out'n western Kansas. I hadn't much of anything to do one fall, and I put in the time a trappin' jack rabbits. I finally managed to get together 100 live jack rabbits, and then, just for amusement, I hitched them rabbits up

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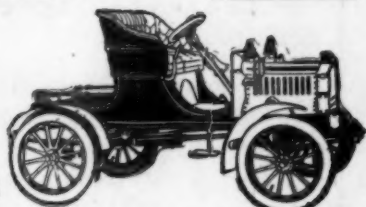
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two by two and trained 'em to drive. They got to be as gentle as dogs, and when the whole 100 were hitched onto a light buggy they could snake it along as easy as could be.

"I got a heap of fun in drivin' round over the prairie with that team of jack rabbits, but one day I was drivin' when a pack of hounds came in sight goin' full tilt after an antelope. In a minute them jack rabbits were flyin' and I couldn't hold 'em. Gentlemen, the time we made beat the fastest record any smoke cart ever done. We went so fast that I hadn't no chance to breathe without turning my face the other way from what we were goin'."

"Well, gentlemen, them jack rabbits run just ten miles and four rods by actual measurement before I could get 'em slowed down, and when I looked at my watch I found that we

had made them ten miles in just four minutes and ten seconds. I want to say to you gentlemen that was goin' some."

Unfortunately the proper understanding of a motor's action can come only with experience. The acquiring of this understanding involves the almost unconscious reading of a great number of symptoms, such as the sounds of the inlet, the whistling of the air in the carbureter, the sharp puff of the exhaust, and all the little metallic clicks and rattles of the various mechanisms. These, taken together, at once reveal whether or not the machine is working normally, or whether it is over or under loaded, and are to be constantly observed, not only by way of noting when anything goes distinctly wrong, but quite as much, to note that everything is going right.

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